



Built Environment Performance Plan

Planning Basis for 2016/2017

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Committee

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EXECUTIVE MAYOR, COUNCILLOR KGOSIENTSO RAMOKGOPA:

“The Remaking of the Capital City is also about intervening decisively in the transformation of human settlements, the space economy as well as the creation of functioning nodes. Thus, as the City of Tshwane remakes itself, it will become home to new monuments as South Africans re-examine, rethink and reconstruct their stories of the recreated City of Tshwane.”

State of the City Address (2015)

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LIST OF APPENDICES

No appendices form part of this report.

LIST OF ACRONYMS

BEPP	Built Environment Performance Plan
CAPEX	Capital Expenditure
CaPS	Capital Planning System
CBD	Central Business District
CIF	Capital Investment Framework
CITP	Comprehensive Integrated Transport Plan
COT	City of Tshwane
DIPS	Development Intervention Portfolios
DORA	Division of Revenue Act (2 of 2013)
FDI	Foreign Direct Investment
GCR	Global City Region
GGMP	Gauteng Growth Management Perspective
GPG	Gauteng Provincial Government
GSDF	Gauteng Spatial Development Framework
ICDG	Integrated City Development Grant
IDP	Integrated Development Plan
IRPTN	Integrated Rapid Public Transport Network
LSDF	Local Spatial Development Framework
MFMA	Municipal Financial and Management Act (56 of 2003)
MSA	Municipal Systems Act (32 of 2000)
MSDF	Metropolitan Spatial Development Framework
MTEF	Medium Term Expenditure Framework
MTREF	Medium Term Revenue and Expenditure Framework
NSDP	National Spatial Development Perspective
OPEX	Operational Expenditure
RSDF	Regional Spatial Development Framework

SAF	Strategic Area Framework
SDBIP	Service Delivery and Budget Implementation Plan
SIP	Strategic Infrastructure Project
SOCA	State of the City Address
SPLUMA	Spatial Planning and Land Use Management Act (13 of 2013)
TOD	Transit Oriented Development
TRT	Tshwane Rapid Transit System
UDF	Urban Development Framework
USDG	Urban Settlements Development Grant

How to Read this Document

Throughout this document the authors have made use of three text boxes called, “Did you know?”, “Important Note” and “Says Who?”. These text boxes assist the reader in taking the essence from the text being presented under each chapter of the report. Each of the text boxes has their own unique symbol to assist the user in identifying their intended meaning, namely:

- “Did you know?” is identified by means of a questions mark



DID YOU KNOW?

This text refers to interesting facts or information, which provides additional background to the topic under discussion.

- “Important Note” is identified by means of an exclamation mark



IMPORTANT NOTE!

This text seeks to highlight important information and summarises an important finding or conclusion, which the reader should note.

- “Says Who?” is identified by means of a speech bubble icon.



SAYS WHO?

This text seeks to highlight quotations or statements, which provides additional background to the topic under discussion.

A Introduction

A.1 Background

Built Environment Performance Plans (BEPPs) were first introduced in the 2011/12 financial year as an eligibility requirement in respect of the Urban Settlements Development Grant (USDG). However BEPPs became one of the eligibility requirements for the Integrated City Development Grant (ICDG) as legislated in the Division of Revenue Act (DORA) (Act 2 of 2013) 2014/15 (first introduced 2013/14).

The BEPP is a brief, strategic overview of the built environment that will be used to enhance inter-governmental relations aimed at improving the performance of metropolitan built environments. It is a city-level plan formulated and approved by the metro, and it complements existing statutory plans and compliance with legal requirements – it does not replace such plans.

The goal of the BEPP is the development of more inclusive, liveable, productive and sustainable urban built environments in metropolitan municipalities. The purpose is therefore to provide a financial incentive for metropolitan municipalities to integrate and focus their use of available infrastructure investment and regulatory instruments to achieve a more compact urban spatial form. The desired outcomes are the improved spatial targeting and sequencing of public investments in the urban built environment to achieve a more compact, inclusive, productive and sustainable urban spatial form.

With an understanding of the Capital Investment Framework (CIF) and the processes that it will facilitate for the city, it is clear that the CIF is the vessel that is also required to respond to the goals, objectives and outcomes of the BEPPs as prescribed by National Treasury. While the focus of the 2014 BEPP processes was on planning for spatial transformation, in 2015 the focus must shift to accelerating the implementation of catalytic interventions.

The BEPP is a requirement of the DORA in respect of infrastructure grants related to the built environment of metropolitan municipalities. It remains one of the eligibility requirements for the ICDG that is an incentive grant that rewards the application of infrastructure grants in terms of a spatial targeting approach at a sub-metropolitan level. The BEPP is thus also an instrument for compliance and submission purposes for the following infrastructure grants:

- ICDG – Integrated City Development Grant, Schedule 5B (specific purpose allocations to municipalities);
- USDG – Urban Settlements Development Grant, Schedule 4B (supplements municipal budgets);

- HSDG – Human Settlements Development Grant, Schedule 5A (specific purpose allocations to provinces);
- PTIG – Public Transport Infrastructure Grant, Schedule 5B (specific purpose allocations to municipalities);
- NDPG – Neighbourhood Development Partnership Grant
 - Schedule 5B (specific purpose allocations to municipalities) Capital Grant;
 - Schedule 6B (allocation-in-kind to municipalities for designated special programmes) TA;
- INEP – Integrated National Electrification Grant, Schedule 5B (specific purpose allocations to municipalities).

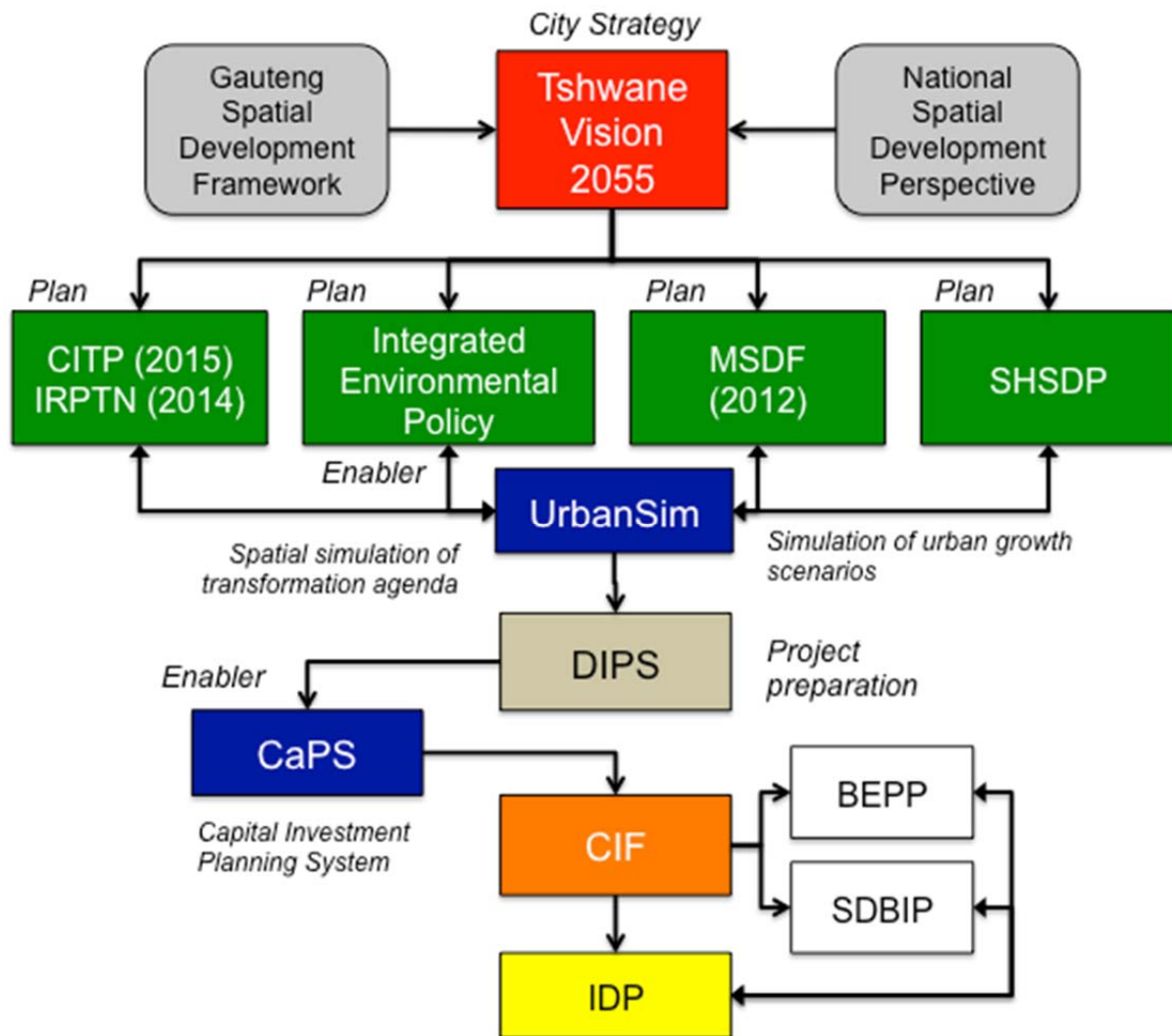
It is the expectation from National Treasury that it would take at least 3 years to establish a credible and funded BEPP. The content requirements of the 2015/16 – 2017/18 BEPP seek to refine, enhance and consolidate the content of the baseline BEPP established in 2014/15. It is therefore important that Tshwane remains in the forefront of this process and be proactive in capitalizing optimally from the enabling environment that is created by the Tshwane Capital Planning System (CaPS).

A.2 Purpose of this Report

This report is the City of Tshwane Draft BEPP 2015/2016 (dated 30 April 2015) which is submitted in line with the BEPP Guidance Note 2015/16-2017/18. This report is submitted that in terms of the Council Approved IDP Process Plan 2015/2016 and as such the Draft BEPP 2015/2016 submission is submitted on the back of the Draft Capital Budget which has been finalised during March 2015. The Final Draft BEPP will be submitted together with the Draft IDP and Capex 15/16 to the Mayoral Committee during the period of May 2015.

The BEPP is a summary and culmination of outcomes of a multitude of spatial planning documents (refer to Figure A-1) within the municipality, and these plans are spatial strategies that ensure that implementation on the ground is guided by a spatial framework that is informed by National and provincial strategies and policies and those at city level, namely, Tshwane Vision 2055, IDP, MSDF, RSDF and LSDF. Each of these plans have a spatial imperative that the city needs to achieve in the short, medium and long-term.

Figure A-1: Hierarchy of Spatial Planning Documents and Enablers



This submission provides the city's approach towards spatial targeting with primary focus on the movement system as the key spatial restructuring element of the built environment. The city is currently undertaking a scientific growth forecasting assignment commissioned by the CSIR, which will inform the formulation of the Tshwane Growth Management Perspective. As per BEPP Council Resolution May 2014, a Tshwane Capital Planning System (CaPS) has been procured, which is the business planning and decision support tool ensuring that capital projects within the city are evaluated according to quantitative, qualitative and spatial transformation criteria as part of the formulation of the annual developmental (capital) budget.

In the compilation of this report, cognisance was taken of the current institutional challenges and processes including but not limited to the issues and flagship projects that was raised as part of the State of the City Address. This process was enabled by the Tshwane Capital Planning System (CaPS), which is a capital investment planning tool for providing business intelligence, data validation, project synchronisation and prioritisation, and project progress related information.

CaPS will ensure an inclusive approach towards the transformation of the City as envisaged by the Tshwane Vision 2055. Programme and project synchronisation both at municipal and other spheres of government is essential, and it is through the implementation of CaPS that seamlessness will be ensured at various stages of project planning and implementation. An comprehensive prioritisation model enshrined in CaPS, built from the City's needs, contains components that will enhance compliance with governance issues, spatial transformation matters, impact and efficiencies and gains for all identified programmes and projects. All spatial priorities and mayoral priority programmes for investment have been categorised, included and mapped for all the seven regions within CaPS.

A.3 Planning Context

A.3.1 National Spatial Development Perspective (NSDP) – The Presidency

The NSDP calls for renewed focus on decisive interventions to ensure inclusive economic growth and to address poverty and promote social inclusion. The NSDP is South Africa's first set of national spatial guidelines, that establishes an overarching mechanism, which enables a shared understanding of the national space economy, provides a principle-base approach to coordinate and guide policy implementation across government an interpretation of the spatial. The NSDP assists government in confronting three fundamental planning questions (given our objective to grow the economy, create jobs, address poverty and promote social cohesion):

- Where should government direct its investment and development initiatives to ensure sustainable and maximum impact?
- What kinds of spatial forms and arrangements are more conducive to the achievement of our objectives of democratic nation building and social and economic inclusion?
- How can government as a whole:
 - Capitalise on complementarities and facilitate consistent decision-making?
 - Move beyond mere focusing on integration and coordination procedures to establishing processes and mechanisms that would bring about strategic co-ordination, interaction and alignment?

Source: NSDP Document – The Presidency

The city's BEPP and CIF as planning documents will assist to answer each of these questions in a way that can show the foundation and underlying analysis that give substance and priority to the proposed initiatives. It will provide the means to measure and report where the maximum impacts

will be of investment and development initiatives. The BEPP / CIF furthermore provides the tool to understand the spatial forms that are most conducive to the achievement of not only national objectives, but also the city's objectives. Most importantly, it will start to facilitate consistent and defensible decision-making, back up by a deep underlying cycle of analysis and prioritisation. The five normative principles that are put forward by the NSDP will be taken into account with the development of the BEPP / CIF as well as its supporting information systems, namely the Tshwane Capital Planning System (CaPS).

A.3.2 Built Environment Performance Plans (BEPPs)

Built Environment Performance Plans (BEPPs) were first introduced in the 2011/12 financial year as an eligibility requirement in respect of the Urban Settlements Development Grant (USDG). However BEPPs became one of the eligibility requirements for the Integrated City Development Grant (ICDG) as legislated in DORA 2014/15 (first introduced 2013/14).

The BEPP is a brief, strategic overview of the built environment that will be used to enhance inter-governmental relations aimed at improving the performance of metropolitan built environments. It is a city-level plan formulated and approved by the metro, and it complements existing statutory plans and compliance with legal requirements – it does not replace such plans.

The goal of the BEPP is the development of more inclusive, liveable, productive and sustainable urban built environments in metropolitan municipalities. The purpose is therefore to provide a financial incentive for metropolitan municipalities to integrate and focus their use of available infrastructure investment and regulatory instruments to achieve a more compact urban spatial form. The desired outcomes are the improved spatial targeting and sequencing of public investments in the urban built environment to achieve a more compact, inclusive, productive and sustainable urban spatial form.

With an understanding of the CIF and the processes that it will facilitate for the city, it is clear that the CIF is the vessel that is also required to respond to the goals, objectives and outcomes of the BEPPs as prescribed by National Treasury.

A.3.3 Gauteng Spatial Development Framework (2011)

The Gauteng Spatial Development Framework (GSDF) is premised on building Gauteng as a sustainable city-region that allows agriculture to provide the link between rural and urban economic development, which is shaped by infrastructure led investment, and is based on public transport - specifically rail as the backbone of accessibility in the future. As an integrated approach to spatial development for 2055, the GSDF contributes to reducing the cost of doing business in the Gauteng

City Region (GCR) by indicating where resources should be spent and the nature and type of infrastructure investment that can create a more equitable society. This will allow the GCR to become more efficient in doing business by providing an enabling environment that supports economic growth through co-ordinated and structured investment spending. In this light the GSDF represents a dynamic spatial management system that is capable of setting broad-scale spatial strategic direction and, simultaneously, permitting detailed enquiry as to what this means spatially at any successive scale or level of planning (GSDF, 2011).

The GSDF sets the tone for much of the planning that is currently underway in all of the metropolitan municipalities in Gauteng. This is also true for the City of Tshwane. The outcomes that are to be achieved are important. The spatial planning and monitoring of strategies towards achieving these outcomes are underway. The BEPP and CIF will contain all of the content and programmes prescribed by the GSDF 2011 and will assist in the tracking, monitoring and adjusting of programmes and projects towards achieving these outcomes.

A.3.4 Tshwane Vision 2055

The City of Tshwane has developed the Tshwane Vision 2055 document. The Executive Mayor states that through this ground-breaking participatory process, Tshwane has collectively clarified and articulated the City's long-term aspirations. Furthermore, the Tshwane Vision 2055 (City of Tshwane, 2013):

- Provides the City with a broad logic to guide growth and development and a programme of action on how to current imperatives of provide high quality of living experiences for the present generation and plan for the future generational needs.
- Serves as a point of reference for the City interventions, priorities and strategic actions over the next 40 years.
- Details the City's interventions that are aimed at breaking the cycle of generational poverty, inequality and underdevelopment.
- Provides us with a platform to establish strategic partnerships with communities and stakeholders to imagine, transform, remake, and build a cohesive and adaptable society.
- Redresses apartheid-bound experience of settlement patterns, social and economic exclusion, which continues to define the city space.
- Focuses on remaking South Africa's capital city, creation of a new identity and ensure that our City becomes a "well connected, well governed and managed City".

From these words, the part that is of specific relevance to the BEPP and CIF, states the following:

“In this regard, we have adopted a planning process and a roadmap that allows us to adopt a series of detailed plans and actions underpinned by interrelated concepts liveability, resilience and inclusivity. These integrative-cluster programmes and plans detail our flagship programmes/projects and delivery agendas for both medium to short term.

We are also of the view that our interventions must be “transformative, bold, “disruptive” and capitalise on the economies scale, crowd-in investors, propel growth, “deracialise” space economy and build on the capacity for inclusion and partnership so as to reduce the cost of delivering services.”

The integrative cluster programmes and flagship programmes will be at the heart of the BEPP and CIF, ensuring that the words of the vision and its underlying goals as articulated by the various programmes stemming from it, is captured in the prioritisation process, and in the subsequent scenario analysis that forms part of the budget fitting and report-back processes.

A.3.5 Tshwane Integrated Development Plan (IDP) 2014/2015

In terms of the Municipal Systems Act 2000 (Act No 32 of 2000), municipalities are required to annually review their Integrated Development Plans (IDPs) in order to assess their level of performance and changing circumstances. The following are the reasons to review an IDP:

- To inform other components of the City’s processes including institutional financial planning and budgeting
- To ensure proper integration and alignment
- To inform and to take into account the inter-departmental planning and budgeting cycle
- To reflect on internal and external changes that might have an impact on priority issues, objectives, strategies, projects and programmes if the IDP is to be reflected in updated sector plans.

The outcomes of the aforementioned process may lead to:

- A refined understanding around priority issues
- Refined or amended or additional objectives of the city
- Revised or new strategies, including strategies to improve implementation
- Revised or new projects

- Reflection of the above in the revised integrated plans and programmes including a revised Medium Term Revenue and Expenditure Framework (MTREF).

Source: CoT IDP 2013/2014

Once more, the BEPP and CIF have been designed specifically with these issues in mind, and will provide Tshwane with a means to plan projects and programmes and track implementation and expenditure towards achieving desired outcomes.

A.3.6 Tshwane Service Delivery Budget Implementation Plan (SDBIP)

“In terms of chapter 1(i) of the MFMA the SDBIP is a detailed plan approved by the mayor of a municipality in terms of section 53(1)(c)(ii) for implementing the municipality’s delivery of services and its annual budget and which must indicate:

(a) projections for each month of-

- (i) revenue to be collected by source; and
- (ii) operational and capital expenditure, by vote;

(b) service delivery targets and performance indicators for each quarter; and

(c) any other matters that may be prescribed.

The MFMA Circular 13 also state that the SDBIP provides the vital link between the Executive Mayor, Council and the administration, and facilitates the process for holding management accountable for its performance. Furthermore it states that the goals and objectives set by the municipality must be quantifiable.”

It must be stated at this point the BEPP and CIF and its supporting information system – CaPS – are often mistaken for a financial system. It is important to remember that the BEPP, CIF and CaPS together form a planning and monitoring system with financial inputs and outputs, amongst others. Collectively they form a tool that will assist the city towards achieving its goals and objectives, whilst providing a platform to measure with a relative degree of ease, the progress towards achieving those outcomes in terms of investment – the quantum of the investment and the geographical spread of such investments measured over time. To this end, the BEPP, CIF and CaPS are engineered toward facilitating the required outcomes as they are foreseen by the SDBIP.

In terms of the legislation, the SDBIP is required to contain in particular, the following:

- Budget Implementation plan
 - Budgeted monthly revenue and expenditure

- Budgeted monthly revenue and expenditure by municipal vote
- Budgeted monthly revenue and expenditure by standard classification
- Budgeted monthly Capital expenditure by municipal vote
- Budgeted monthly Capital expenditure by standard classification
- Consolidated Budgeted monthly cash flow
- Consolidate capital expenditure by asset class
- Consolidated future implications of the capital budget
- Consolidated detail capital expenditure
- Consolidated projects delayed from previous year
- Service Delivery Breakdown
- Measurable performance indicators

The standardised reporting functionality that will be introduced through the CaPS system will allow for the automation of much of these requirements on a monthly, quarterly or whichever other frequency may be required at the time – given that all capital projects are captured and categorised appropriately within the system.

A.3.7 Gauteng Provincial Government Multi-Pillar Programme of Radical Transformation

Premier David Makhura during his maiden State of the Province Address stated that his administration has adopted multi-pillar programme of radical transformation, modernisation and reindustrialisation of Gauteng that will be actively pursued over the next five to fifteen years. In so doing, decisive steps will be taken to make Gauteng an integrated city-region characterised by social cohesion and economic inclusion.

These pillars are:

- Pillar 1: Radical Economic Transformation

The provincial government has identified key sectors of that have the potential to address the twin policy imperatives of creating decent employment and greater economic inclusion. These sectors include finance, automotive industry, manufacturing, ICT, tourism, pharmaceuticals, creative industries, construction and real estate. The promotion of new SMMEs and township enterprises will also be brought into these key sectors of the economy.

- Pillar 2: Decisive Spatial Transformation

The provincial government wants to radically transform the spaces people live in by connecting and integrating places of work and human settlements. In the next five to fifteen years, Gauteng will turn the tide against the current spatial patterns of apartheid in pursuit of spatial transformation and modernisation of human settlements in the province. Steps will be taken to transform the spatial configuration and landscape of Gauteng province through better and coordinated land use management and spatial development. The provincial government will work with municipalities and state-owned enterprises to ensure that a new built environment and inclusive spatial landscape emerges across the Gauteng city-region.

- Pillar 3: Accelerated Social Transformation

At the centre of Gauteng's social transformation is the objective that seeks to improve the quality of education, healthcare and safety and security (with a particular focus on women and children).

- Pillar 4: Re-industrialisation of Gauteng Province

The massive rollout of public transport infrastructure across the province shall be utilised to revitalise and modernise old industries that will locally manufacture or assemble buses, trains and locomotives. In order to boost employment and economic inclusion, the provincial government and municipalities will procure 75% of all goods and services from South African producers, especially SMMEs, township enterprises and black owned, women and youth enterprises. The government is working closely with state-owned enterprises, PRASA and TRANSNET, to re-industrialise our province and build economic infrastructure that will boost employment creation and economic inclusion through investing more than R300 billion in post, freight, rail and pipeline capacity.

- Pillar 5: Modernisation of the Economy

The provincial government has identified key sectors of that have the potential to address the twin policy imperatives of creating decent employment and greater economic inclusion. These sectors include finance, automotive industry, manufacturing, ICT, tourism, pharmaceuticals, creative industries, construction and real estate.

- Pillar 6: Modernisation of the Public Service

The modernisation of the public service will inter-alia involve how it deals with and eradicates corruption among public officials and public servants, including in the private sector. Gauteng government will introduce measures to strengthen the integrity of public institutions and public processes so that fraud and corruption are prevented and detected early in the value chain to

prevent losses. Furthermore, there will be strong emphasis within local government to be more people centric, especially towards serving the public.

- **Pillar 7: Modernisation of Human Settlements and Urban Economy**

With regard to existing human settlements, Gauteng shall make extra efforts to invest in the renewal of townships, especially the twenty-five old townships and old informal settlements that have been neglected. Gauteng government will speed up the handing over of existing housing projects that are complete and will make sure that all houses are allocated to the legitimate owners. The provincial government will work with municipalities and national government to ensure that all township roads and streets are tarred, eradicate the bucket system, all hostels turned into family units and prevent illegal land invasion and growth of informal settlements. Better and integrated urban planning and development is the best way to manage rapid urbanisation.

- **Pillar 8: Modernisation of Public Transport Infrastructure**

Combined with public transport infrastructure rollout and the development of the Aerotropolis, and OR Tambo Special Economic Zone, driven by the provincial government and municipalities, public transport infrastructure investment has a major potential to create more than 300 000 jobs and boost the development of new SMMEs and township enterprises. New post-apartheid cities will be a combination of modern public transport modes, integrated and sustainable human settlements that are socially and economically inclusive and promote urban green development.

- **Pillar 9: Taking the lead in Africa's New Industrial Revolution**

As we undertake the onerous task of radical economic transformation, we do so knowing fully well that ours is currently the leading economy in the country and SADC region and a key player in Africa's economy. According to the World Bank Development Report, between 2000 and 2010 six of the ten fastest economies were from Africa. Gauteng is the fourth biggest economy in the continent, contributing 11% to Africa's economy. Globally there has been an economic shift towards countries of the south, particularly the (Brazil, Russia, India, China and SA) BRICS countries.

A.4 Long Term Strategic Vision

On 27 August 2013, the Council approved the Tshwane Vision 2055, a long-term strategic plan through which the City seeks to improve the social, economic and management of the natural environment. The Tshwane Vision 2055 sets out the city's vision and long-term strategic agenda and

the Integrated Development Plan (IDP) outlines the priorities and key programmes for the Mayoral Term. Through these strategic documents, we seek to address the challenges of urbanisation and migration, economic development and job creation, service delivery, poverty, urban renewal and regeneration, globalisation, the need for information technology and the bridging of the digital divide and other related challenges. The identified outcomes of the Tshwane Vision 2055 which needs to be achieved over the next four decades are as follows:

- Outcome 1: A resilient and resource efficient City
- Outcome 2: A growing economy that is inclusive, diversified and competitive
- Outcome 3: A City with quality infrastructure development that supports liveable communities
- Outcome 4: An equitable City that supports happiness, social cohesion, safety and healthy citizens
- Outcome 5: An African Capital City that promotes excellence and innovative governance solutions
- Outcome 6: South Africa's Capital with an activist citizenry that is engaging, aware of their rights and presents themselves as partners in tackling societal challenges

The long-term vision of the City is as follows:

“In 2055, Tshwane is liveable, resilient and inclusive whose citizens enjoy a high quality of life, have access to social, economic and enhanced political freedoms and where citizens are partners in the development of the African Capital City of excellence”.

The above Vision and Outcomes are a basis on which future planning, infrastructure investment and resource allocation and collaboration will be premised upon as part of the complete Remaking of the Capital.

A.5 BEPP Annual Planning Cycle

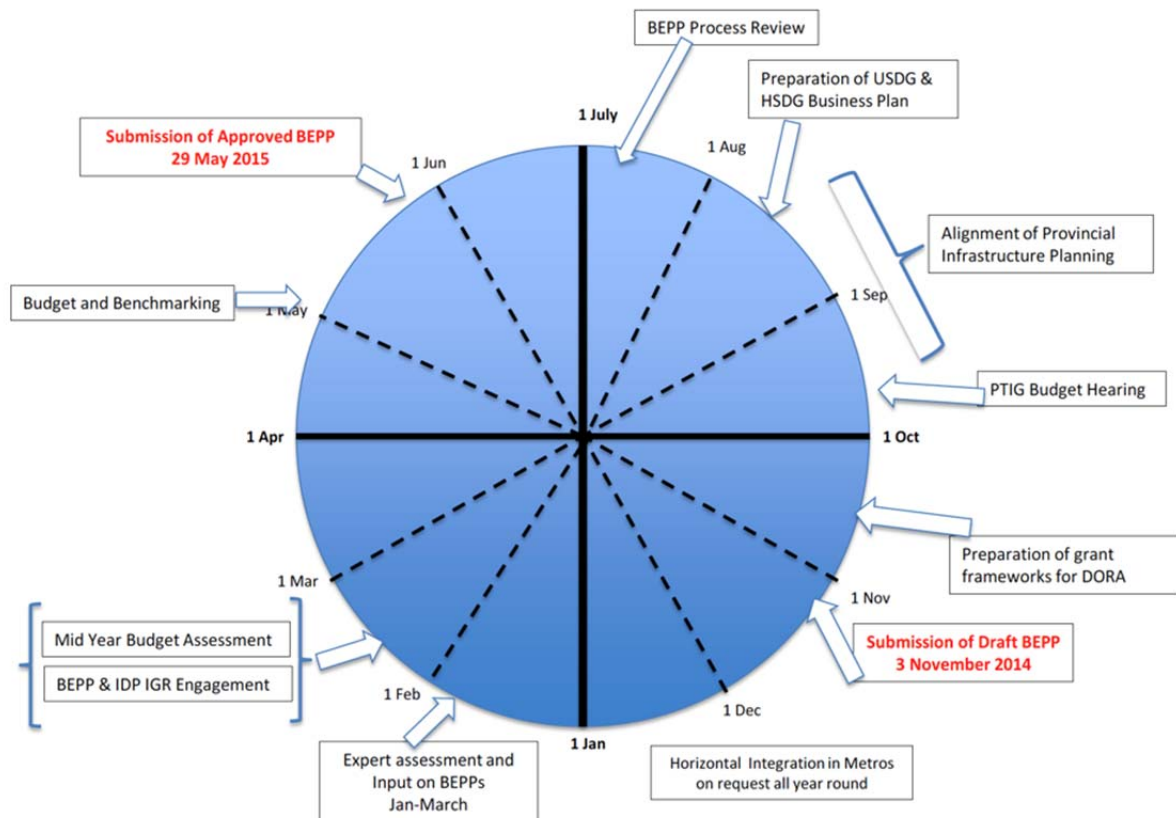
The BEPP annual planning cycle is prescribed by National Treasury as part of the BEPP Guidance Note 2016/17-2018/19 and is shown below in Table A.3.7-1 and Figure A-2.

Table A.3.7-1: BEPP Annual Planning Cycle

BEPP Phases	Output	Time frames
Phase 1: Planning of BEPPs		
Internal Council process for formulation of Draft BEPP with a focus on horizontal integration of built environment functions.	Integrated planning of built environment.	1 July – 31 October
Planning sessions with relevant sector departments (and other key stakeholders of	Alignment between planning for the built environment and sector planning.	

BEPP Phases	Output	Time frames
required)		
Council strategic planning		October - January
Submission of Draft BEPP to National Treasury in respect of DORA requirements	Draft BEPP	1 November
National Treasury immediately shares Draft BEPPs with relevant sector departments and IGR stakeholders, requesting comments and inputs to the Draft BEPP.	Distribution and sharing of Draft BEPPs Invite to sector departments and stakeholders for comments and inputs to Draft BEPPs.	5 November
Phase 2: Review of Draft BEPPs		
Comments and inputs from relevant sector departments and IGR stakeholders collated by National Treasury and submitted to Metros	Metros receive comments and inputs to Draft BEPPs	30 November
Work sessions between departments/stakeholders who submitted comments/inputs, if required	Sector refinement of Draft BEPP	1 December – 20 January
Mid-Year Budget Review	Draft BEPP informed by results of previous FY and mid-year financial results	25 January – 28 February
BEPP IGR Engagement	Combined refinement of Draft BEPP	
Submission of Draft IDP	Draft IDP	31 March
IDP Assessment; Alignment of BEPP and IDP	Alignment of BEPP and IDP	1 – 30 April
Budget and Benchmarking	Alignment of BEPP & IDP to Budget	31 March – 30 May
Phase 3: Finalisation and Council approval of BEPPs		
Council approval of IDP, BEPP and Budget	Council Approved BEPP, IDP & Budget	31 May
Phase 4: Implementation of BEPPs		
Annual implementation of plans	Service delivery	
Phase 5: Monitoring & Performance of BEPPs		
Quarterly Reports - Section 71 Reports	In-year monitoring and evaluation	31 Oct; 31 Jan; 30 Apr; 31 July
Annual Report	Annual monitoring and evaluation	31 January

Figure A-2: BEPP Process and Timelines



A.6 Council Resolution

The Draft BEPP 2016/2017 will be presented to the Mayoral Committee on 21 October 2015 for approval, where after it will be submitted to the Municipal Council for adoption in 2016 together with the Draft IDP 2016/17 Review, Draft 2016/17 SDBIP and the Draft 2016/19 MTREF as per approved IDP Process Plan 2016-2022.

A.7 List of Reference Documents

The following reference documents were consulted during the development of this report:

- National Spatial Development Perspective (NSDP) (2009)
- Built Environment Performance Plans Guidance Note 2016/17 MTREF
- Gauteng Spatial Development Framework (GSDF) (2011)
- Tshwane Vision 2055
- Tshwane Integrated Development Plan (IDP) 2015/2016
- Tshwane Service Delivery Budget Implementation Plan (SDBIP)

- Gauteng Provincial Government Multi-Pillar Programme of Radical Transformation
- Spatial Development Framework (SDF) Planning Policy for Tshwane Rapid Transit (TRT)
- Integrated Rapid Public Transport Network (IRPTN) Land Use – Transport Integration Plan
- MAYCO Resolution 05 February 2014; Identified Investment Mechanisms to Incentivise development within the City of Tshwane (UDZ Report)
- City of Tshwane (CoT) Spatial Atlas (Demographics)

B Strategic Review of the Built Environment

B.1 Current Performance of the Built Environment

BEPP Content Guidelines – as per BEPP Guidance Note 2016/17-2018/19

This section of the BEPP should seek to:



- Summarise and quantify major trends, development pressures and opportunities within the built environment
- Identified catalytic urban development projects
- Identified impediments to growth and development and implications on implementation of the catalytic urban development projects and spatial development

B.1.1 Major trends and pressures in the built environment

B.1.1.1 Tshwane's Provincial Context

Tshwane lies within the smallest of the country's nine provinces, Gauteng (Figure B-1). Tshwane's neighbouring provinces are North West Province, Mpumalanga, the Free State and the Limpopo Province. The Tshwane metropolitan area lies in the northern part of Gauteng, at the confluence of the N1 and N4 national roads. It forms part of the Tshwane - Johannesburg - Ekurhuleni city region and it lies north of Johannesburg and north-west of Ekurhuleni. This vast conurbation forms the economic powerhouse of South Africa and indeed of Africa.

Figure B-1: Geographical Context - Tshwane



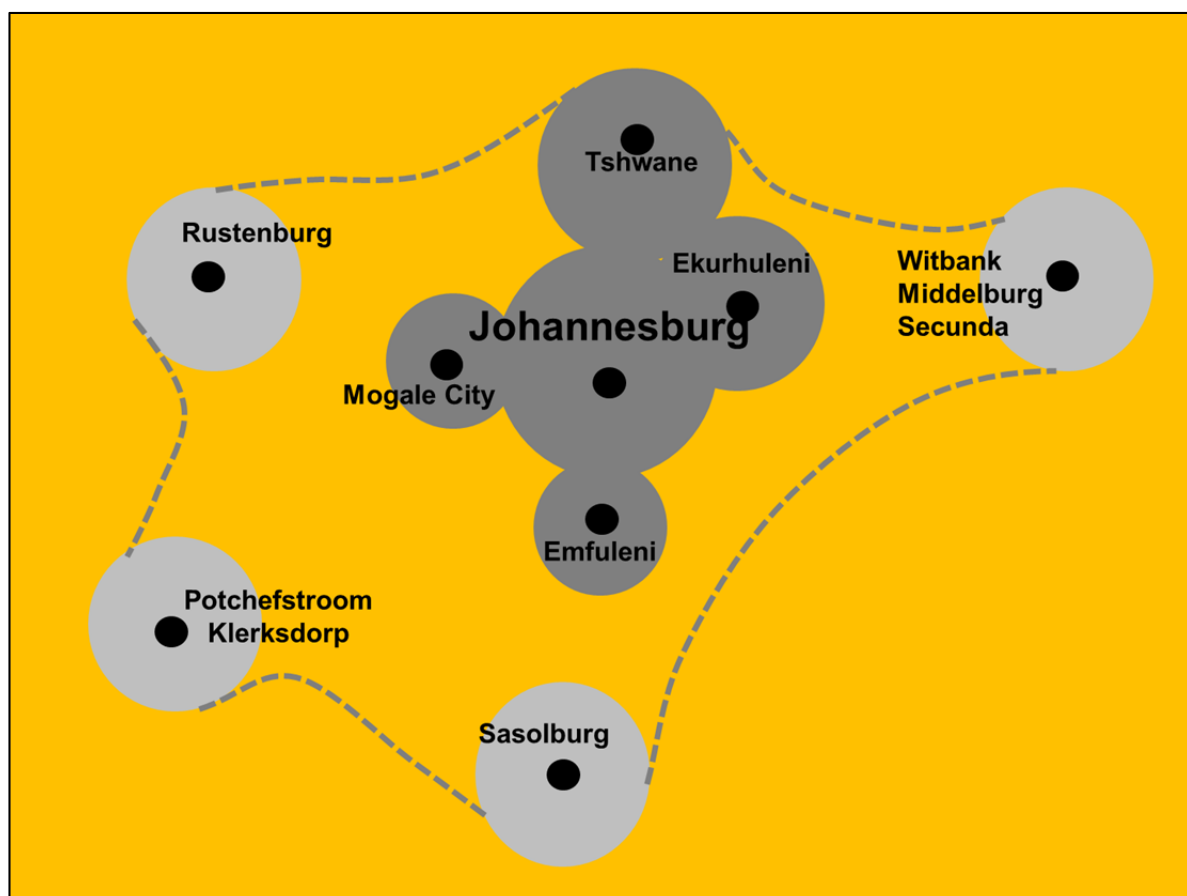
Premier David Makhura during his maiden State of the Province Address in 2015 stated that his administration has adopted multi-pillar programme of radical transformation, modernisation and reindustrialisation of Gauteng that will be actively pursued over the next five to fifteen years. In so doing, decisive steps will be taken to make Gauteng an integrated city-region characterised by social cohesion and economic inclusion.

An issue that particularly resonates with this BEPP, is the intention of the provincial government to radically transform the spaces that people live in by connecting and integrating places of work and human settlements. It was said, that in the next five to fifteen years, Gauteng intends turn the tide against the current spatial patterns of apartheid in pursuit of spatial transformation and modernisation of human settlements in the province. Steps will be taken to transform the spatial configuration and landscape of Gauteng province through better and coordinated land use management and spatial development. The plan is that the provincial government will work with municipalities and state-owned enterprises to ensure that a new built environment and inclusive

spatial landscape emerges across the Gauteng city-region. Although many of these aspects are also intonated and included in Tshwane’s Vision 2055, albeit in a different guise, it is important to assimilate these objectives into the strategic planning that is required to propel the City of Tshwane towards achieving its own Vision whilst simultaneously collaborating with the Provincial objectives. The pillars as provided in the SOPA will be used a gauge to measure the extent to which the proposed transport solution contained in this document, will contribute towards achieving these goals.

In 2006, the GPG published the ‘Gauteng Global City Region Perspective’. This document outlined the key elements of a globally competitive city-region and the steps that are required to bring it to reality. After this document, the ‘GCR Road Map’ was published in 2008. In the road map, 11 strategic pathways were provided and discussed for the proposed establishment of the GCR – the importance of long-term planning was emphasized. The content of these documents eventually gave rise to- and was incorporated into the ‘Gauteng Vision 2055: The Future Starts Here’, a working paper that used scenario planning techniques to encourage strategic debate on the long-term future of the city-region, of which Tshwane will be a key role player.

Figure B-2: Diagrammatic Depiction of the Gauteng City Region



The document states that the GCR is faced with two key challenges in relation to its spatial economy: a spatial mismatch between places of work and the areas in which people live, and a skills mismatch between skills held by those within the city-region, and available employment opportunities. Figure B-3 shows the formal work opportunities as they were in 2010. For Tshwane, it shows that most (50% of the job opportunities still resides in the CBD of Tshwane with various emerging nodes in the east and the south of Tshwane.

Figure B-3: Gauteng Formal Work Opportunities 2010

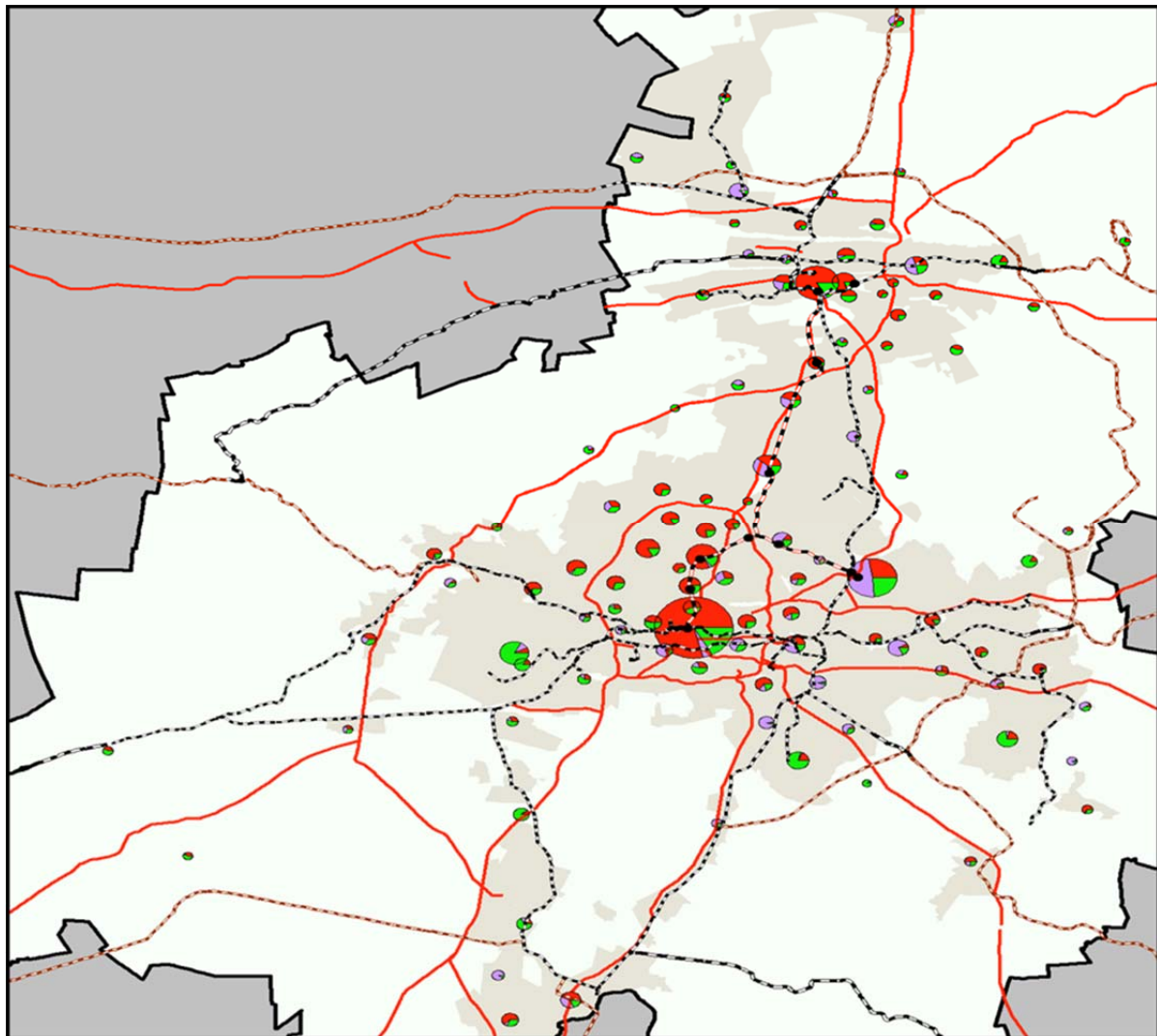
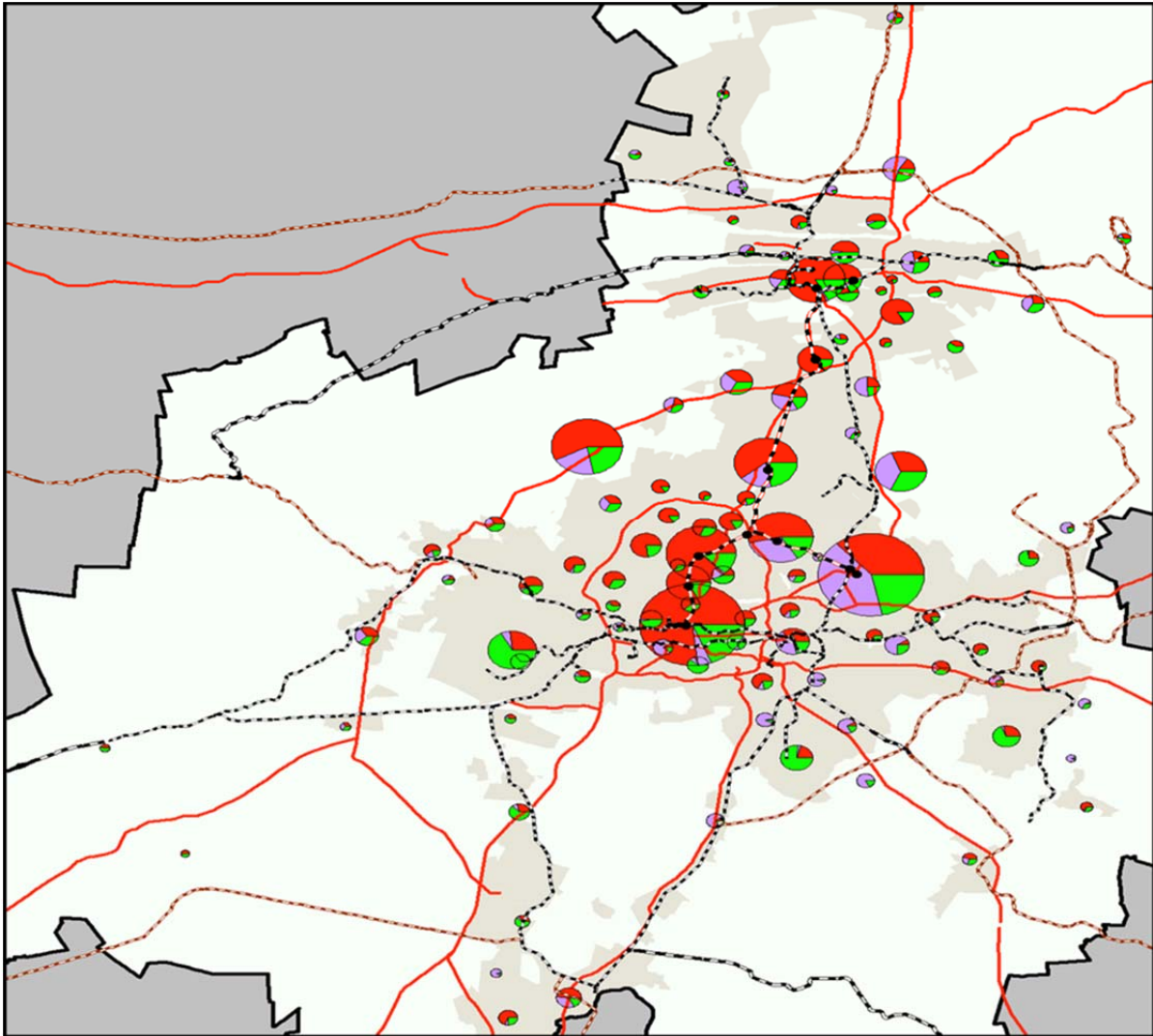


Figure B-4 should be viewed in the context of Figure B-2 that showed the strong “gravitational pull” of the neighbouring metros that is busy transforming the core of Gauteng into what has been termed by some sources as a future “megatropolis”. The future growth of economic opportunities and densification will therefore gravitate to the south of Tshwane as shown in Figure B-4. It is however not the only growth that emerges strongly. It is interesting to note that the anchor of job opportunities in the CBD going forward, stays rather static but that significant growth can be

observed in all the emerging nodes to the north, east and south-east of Tshwane in addition to the strong growth towards the south.

Figure B-4: Gauteng Formal Work Opportunities 2037

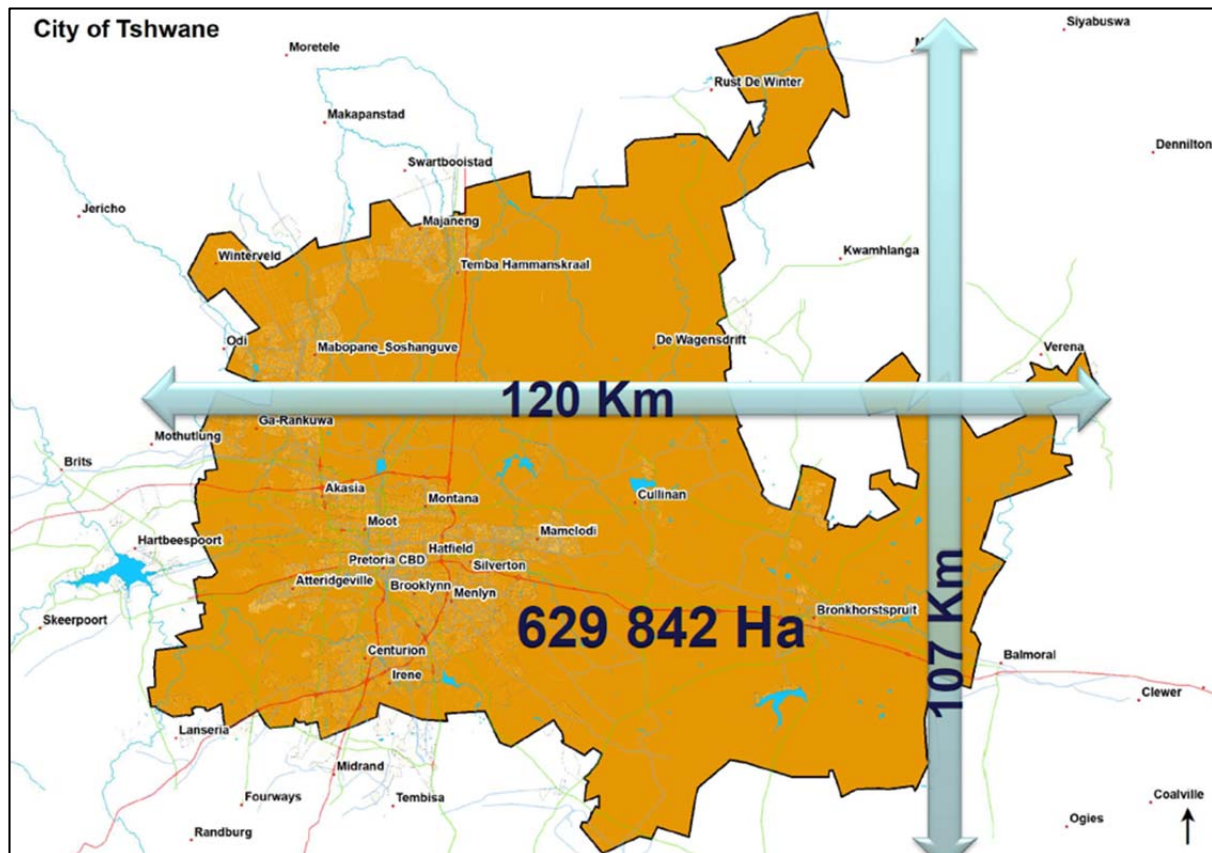


B.1.1.2 Tshwane's Basic Metrics

This City of Tshwane is among the largest cities in the world geographically – it covers an area of approximately 630,000 hectares (Figure B-5). The total population of the City of Tshwane (CoT) was 2.9 million. This municipality makes the second largest contribution to the provincial GDP at 27%, with the tertiary sector's government, social & personal services and finance and business services in the forefront. Many national government departments, foreign embassies and tertiary educational institutions are housed in the city. The municipality is also known as a manufacturer and assembler of passenger vehicles that are mainly produced in the Rosslyn and Pretoria East areas. According to the Automotive Industry Development Centre, the municipality produces 40% of South Africa's

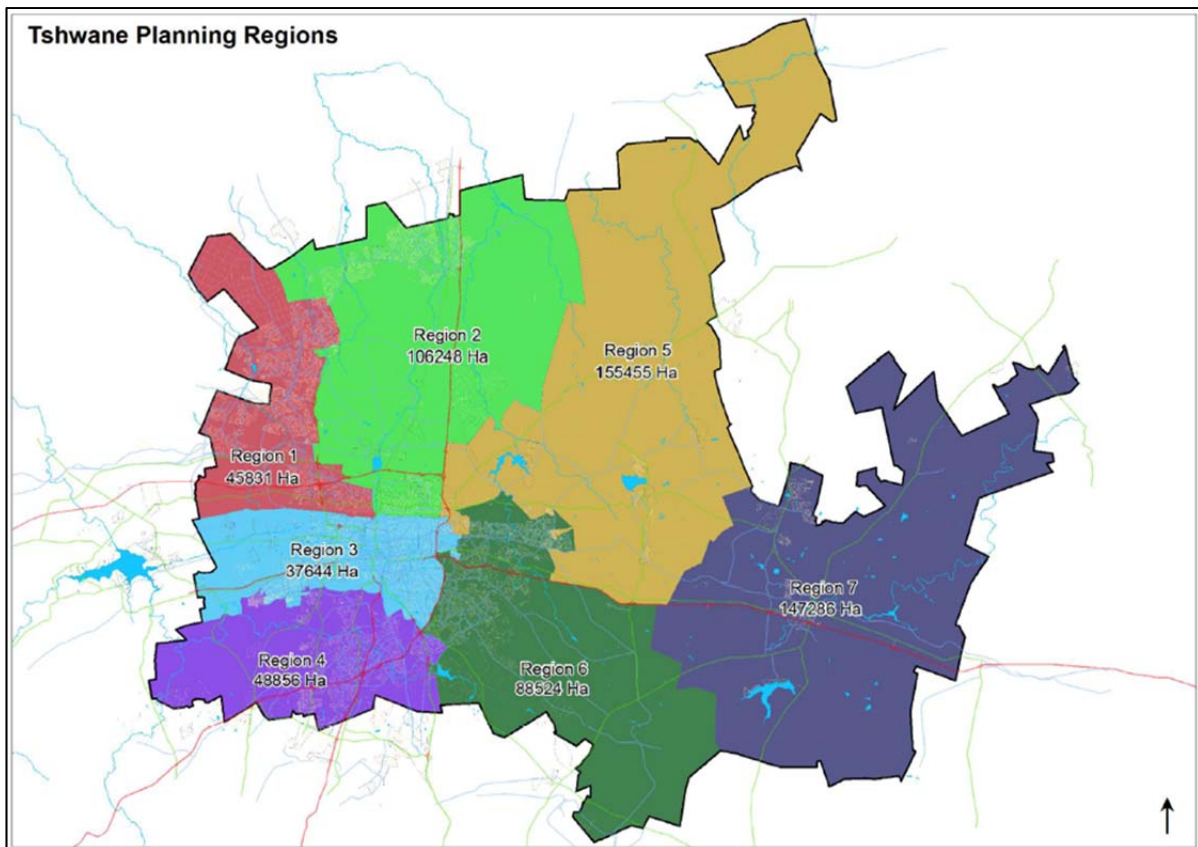
automotive output. The municipality exports more than it imports and also has a growing tourism sector that contributes to job creation and investment.

Figure B-5: Geographical Extent – City of Tshwane



Tshwane is divided into seven administrative planning regions as shown in Figure B-6. These administrative regions are not official municipal demarcations, but a segment of territory (space/area) over which administrative and spatial planning decisions apply. The primary objectives of these regions are to promote effective and efficient service delivery in the regions and to take municipal governance closer to all communities and stakeholders in the city.

Figure B-6: Geographical Extent of each Administrative Region



The population per planning region is shown in Figure B-7 for 2001 and 2011. It shows that significant growth has taken place in regions 1, 3, 4, 6 and 7. Interestingly this trend is also mirrored by the increase in households as shown in Figure B-8. In subsequent sections of this BEPP report, it will be shown that this growth in households comprise mostly of the poor to middle-income groups.

The Census 2001 and 2011 shows that the highest growth rates were experienced in Planning Region 4 and Planning Region 6, however, population has increased in all Planning Regions although Planning Region 1 still remains the largest in terms of population size.

Figure B-7: Population per Planning Region

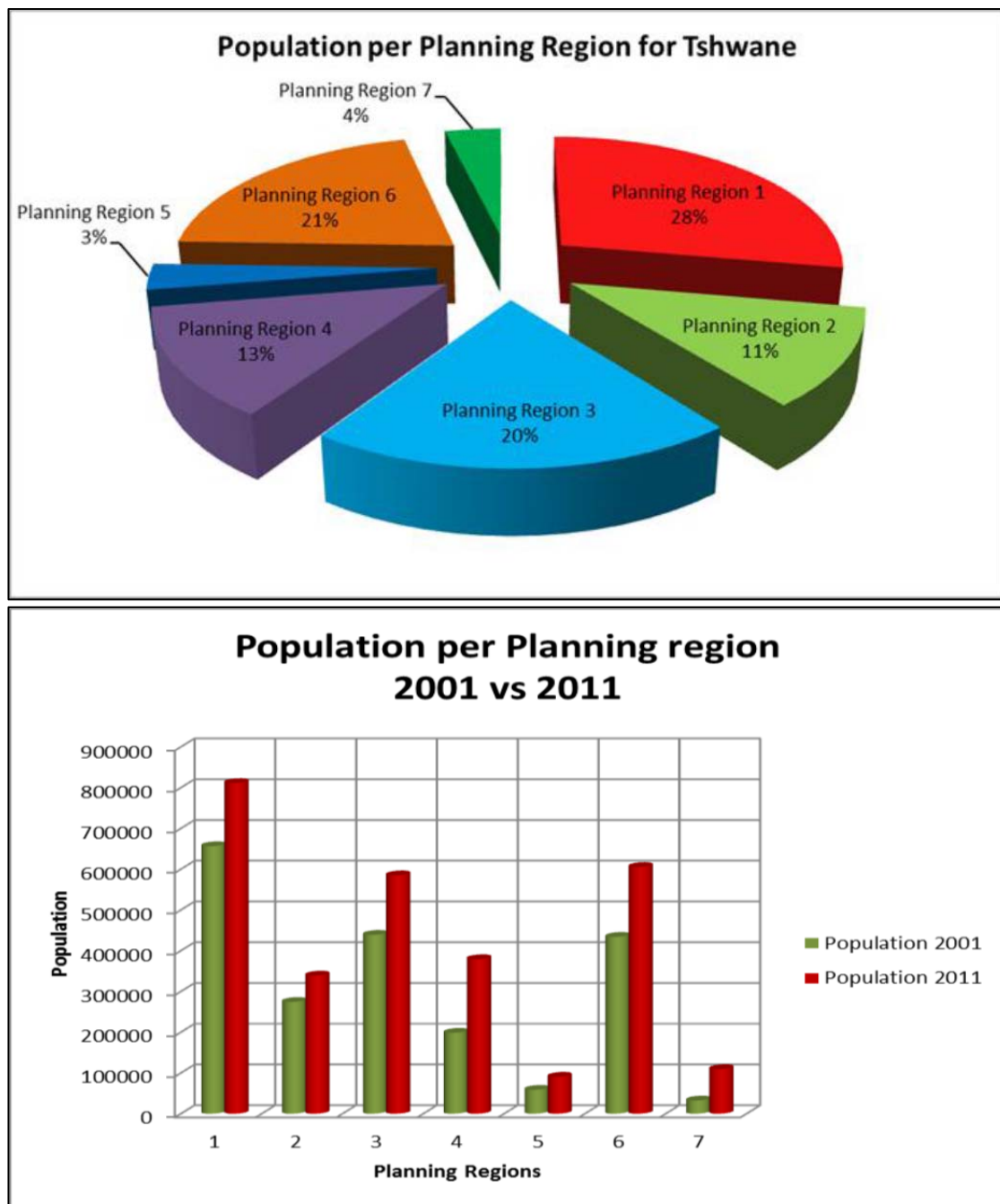
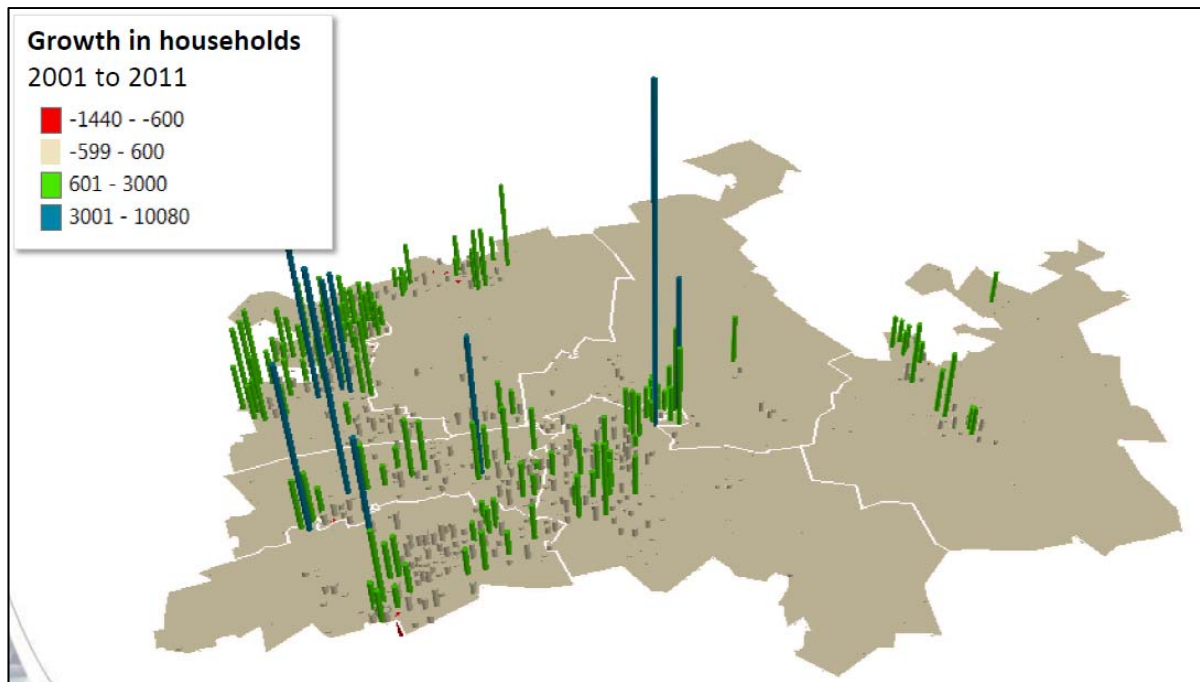


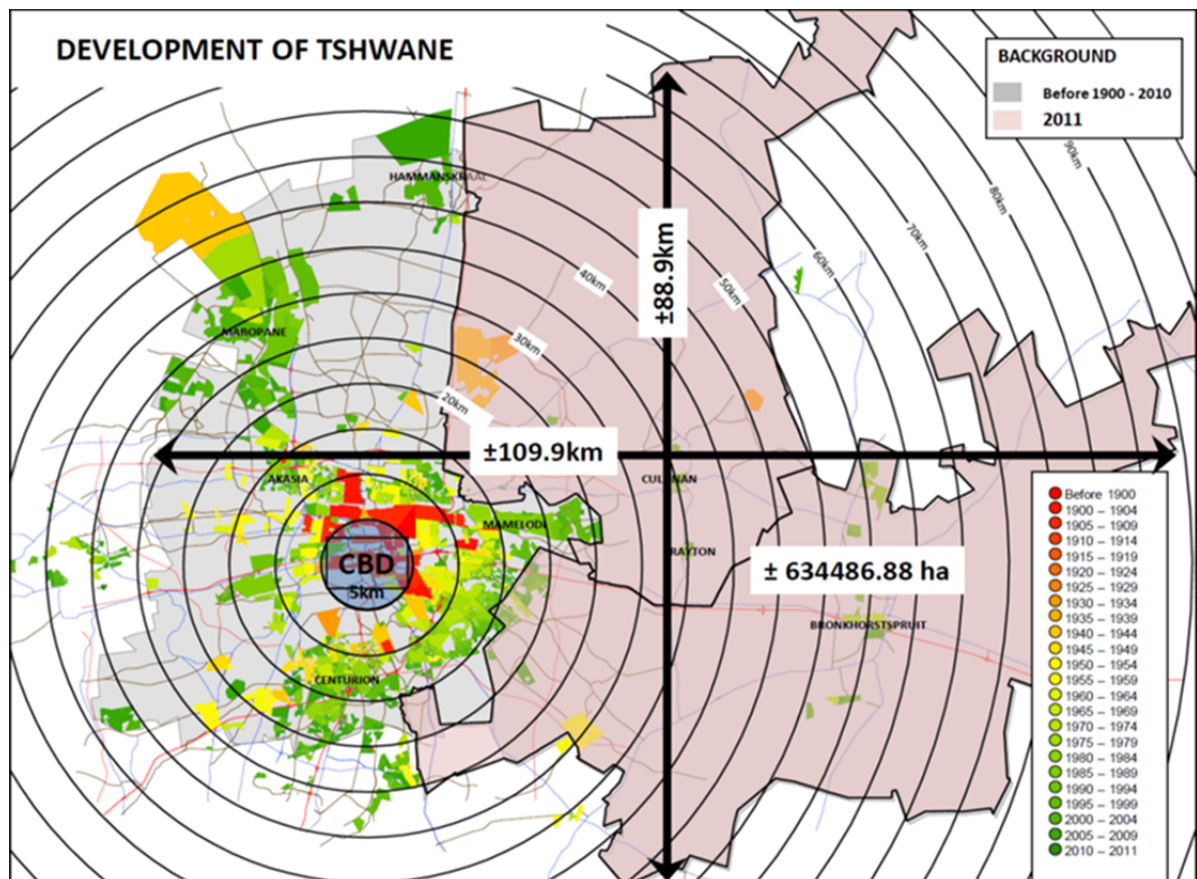
Figure B-8: Tshwane Growth in Households



Tshwane's historical spatial growth pattern as shown in Figure B-9 shows that the spatial growth pattern was not as a result of planned growth. In its current form today, it began as a mono-centric city before the 1900s with the Capital Core (Pretoria CBD) the main economic hub. With the development of the rail network, the city grew to the immediate east and west areas, but the east and south of the city later became the growing areas of residential development and economic centres influenced by highly-skilled, higher income communities.

The inclusion of the erstwhile North West Province municipal areas north of Tshwane further added new settlements in marginalized areas far-removed from any meaningful economic activities. These areas were developed where land was cheaper and rural in nature. The recent amalgamation with the erstwhile Metsweding Municipal further added to Tshwane's land mass, but also providing some opportunities of linking Tshwane's economic activities through the Maputo Corridor to the east and Limpopo Tourism Corridor to the North, but it is the displaced communities that should be well-considered in the building of the Capital.

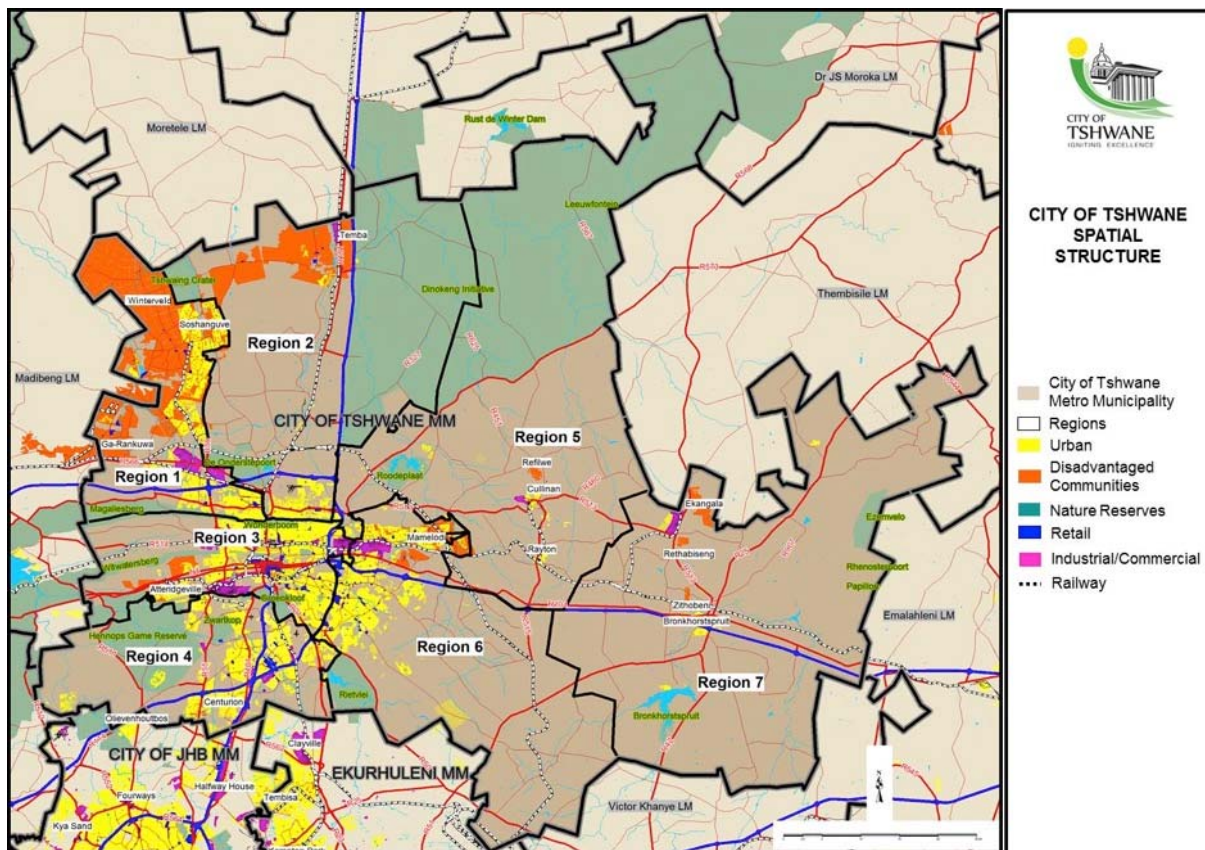
Figure B-9: City of Tshwane Historical Spatial Growth Pattern



The spatial structure of Tshwane is shown in Figure B-10. It comprises a large urban complex located in the western half of its area of jurisdiction, and a predominantly rural environment towards the east and north-east. The urban complex comprises a large residential component (yellow) with the previously disadvantaged communities and informal settlements (orange) being located on the peripheral parts of the urban complex – especially towards the north (the Ga-Rankuwa-Mabopane-Soshanguve- Winterveld-Temba complex); the east (Mamelodi-Eersterust); the west (Atteridgeville); and south (Olivenhoutbosch).

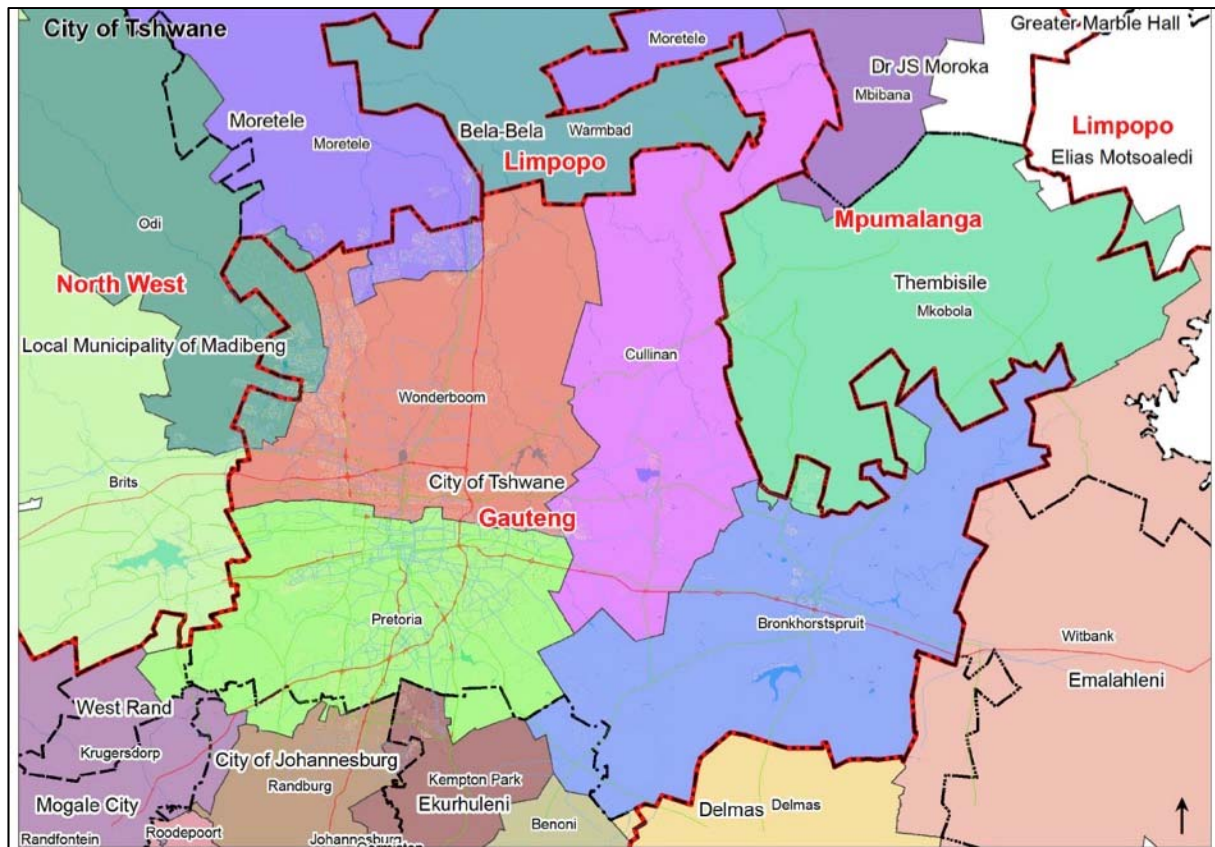
The south-eastern suburbs of the metropolitan complex predominantly represent the higher income communities, and therefore also attract a large number of office and retail activities. The City of Tshwane has a multi-nodal structure with the Inner City/CBD being the dominant node in terms of economic activity and job opportunities.

Figure B-10: Tshwane Spatial Structure



Large rural communities reside in areas adjacent to the City of Tshwane – especially in the Madibeng and Moretele municipalities to the north-west, and Thembisile towards the north-east. Large numbers of people commute daily to the City of Tshwane from these areas. A number of smaller towns exist in the eastern rural parts of the City of Tshwane, including Cullinan-Refilwe, Rayton, Bronkhorstspuit-Zithobeni and Rethabiseng-Ekangala (Figure B-11).

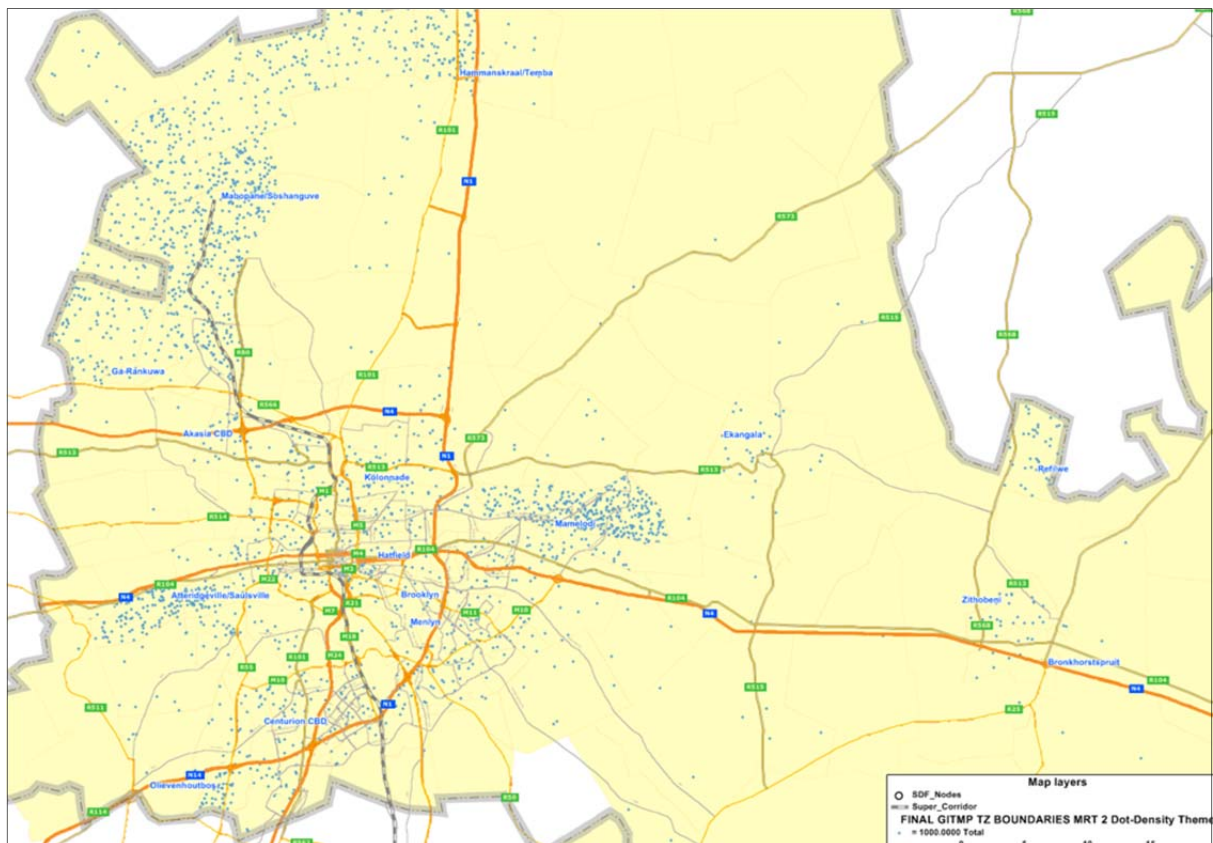
Figure B-11: Districts of Tshwane and Surrounding Areas



Tshwane’s expansive geographical area means that the city comprise of a vast area of diverse sub-areas, each with its own characteristics. From a planning perspective, the population density provides a good point of departure. The map shown in Figure B-12 provides an overview of the average population densities for different areas in Tshwane. The number of people within an analysis zone is presented as a dot per 1000 people. The more dots, the denser the area is populated. The dense areas are shown in the figure with the main areas of high and dense population in Soshanguve, Mamelodi and Atteridgeville. Hammanskraal and Ga-Rankuwa.

It is interesting to note that some of the outlying areas of Tshwane is very sparsely populated. From an infrastructure investment point of view therefore, the notion of working towards a more compact city, and directing investment towards the more densely populated areas will result in more sustainable outcomes, a better economic return on investment and a better improvement on the overall liveability of Tshwane’s citizenry.

Figure B-12: Tshwane Population Density



B.1.1.3 Tshwane's Demographic Overview

The population of Tshwane as recorded by the 2011 census amounts to 2,921,488 people in total. The breakdown of this population per age group is shown in Figure B-13. It shows that between the ages of 20 and 29, there is a significant portion of the overall population. This is also the segment of the population that is regarded as the main entrants into the job-market.

There is also a large component of tertiary learners in this segment that are furthering their studies at institutions such as UNISA, Pretoria University, University of Pretoria faculty of Veterinary Science, ARC-Onderstepoort Veterinary Institute and Tshwane University of Technology. The jump in population from the 15-19 group to the next group is substantial. It suggests that there is indeed an influx of people between the ages of 20 and 29 from outside the boundaries of Tshwane. This influx seems to support the assumption that at least some of this can be attributed to the tertiary institutions in Tshwane and others are likely to simply be job-seekers.

Figure B-13: Tshwane Population 2011 Distributed by Age Group

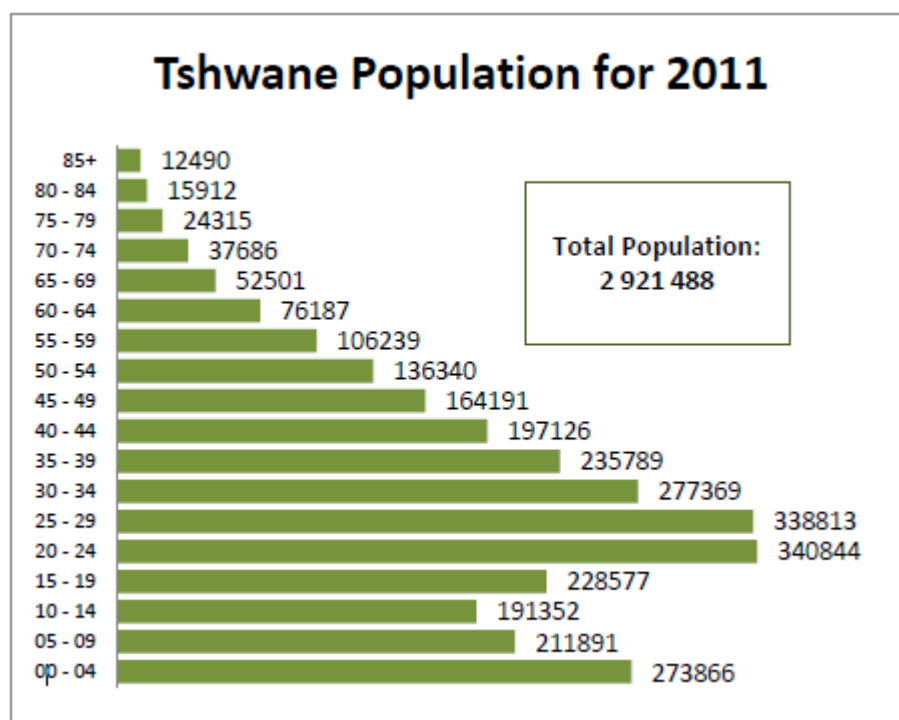
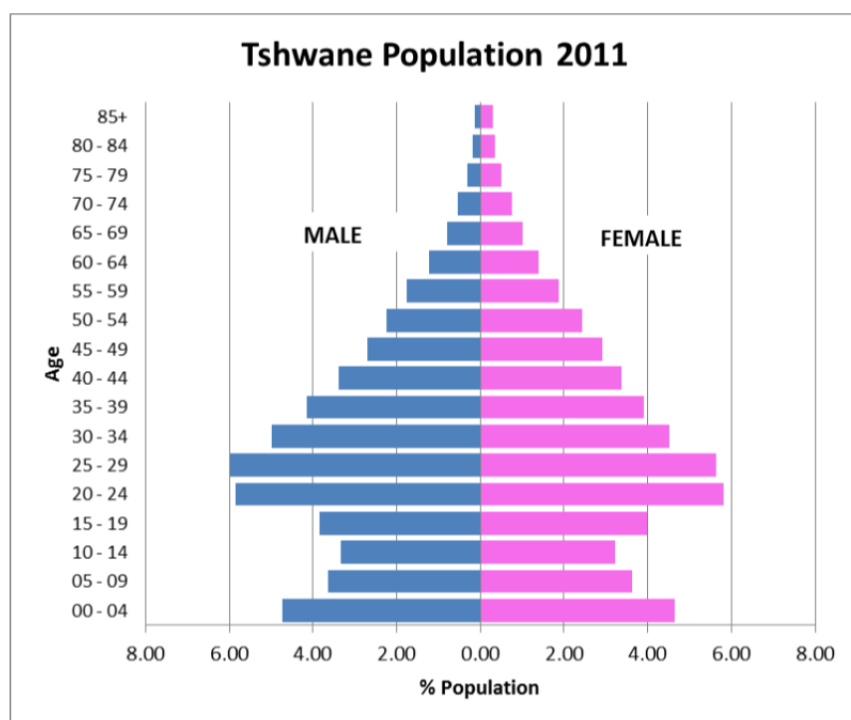


Figure B-14 provides the population distribution per age and gender. The same approximate distribution was observed during the 2001 Census. Although the needs to enhance the economy of Tshwane has been well articulated on many levels, and most recently by the EM during his State of the City address in 2014, the specific triggers or mechanisms to unlock this growth still needs to be well understood. From this analysis, it is clear that the tertiary education sector in Tshwane is a very important aspect that needs to be enhanced, enabled and supported by the City. This support can take many forms such as transport, the recent roll-out of free wifi at certain areas, etc. Although a further, obvious aspect of focus should be job-creation, the data derived from the population age distribution seems to suggest that a focus on entrants into the job market of Tshwane could potentially yield significant and immediate benefits to the local economy. Artisans training programmes and apprenticeship programme should be considered and ways to support and enable this to happen.

The South African population has grown by more than 15% between 2001 and 2011. Within the same period, Gauteng has grown 30% during this period. Tshwane's population growth exceeds that of the Gauteng region at 36% for the same period having the second highest growing population after the City of Johannesburg. The population distribution as shown in Figure B-14 is a reality for Tshwane. It is unique and characteristic to a developing economy. It shows that ways need to be found to transform the wide lower base of the tree into active participants in the economy going forward.

Figure B-14: Tshwane Population per Age and Gender - 2011



The population per ethnic group is shown in Figure B-15. Planning Regions 1 and 2 have a predominant black representation due to the previous Black Administrative Area enforced by the Black Community Development Act of 1984, townships located in these areas are GaRankuwa, Mabopane, Soshanguve, Winterveld and Hammanskraal to name but a few. Regions 3, 4 and 6 on the other hand have a larger representation of the white population, but show a fairly balanced ethnic composition. The Indian population lives mostly in Planning Regions 4 and 3. The coloured population is less prevalent in Tshwane and mostly resides in Planning Region 6.

Between 2001 and 2011, the black population of Tshwane has grown by 40.9% whilst the rest collective have grown by 24.2%. The growth for each ethnic group within the population of Tshwane is shown in Figure B-16. Not much should be read in the 100% growth of the category labelled "Other" as it simply is a category that was not recorded during the 2001 Census.

A total of 86% of Tshwane's migrants hail from other areas within the Gauteng Province. Out of other provinces, migrants from Limpopo Province are most prevalent followed by migrants from outside of South Africa. Migrants from North West Province prefer to settle in Planning Region 1 whereas migrants from Limpopo Province prefer to settle in Planning Region 3.

Figure B-15: Population per Ethnic Group

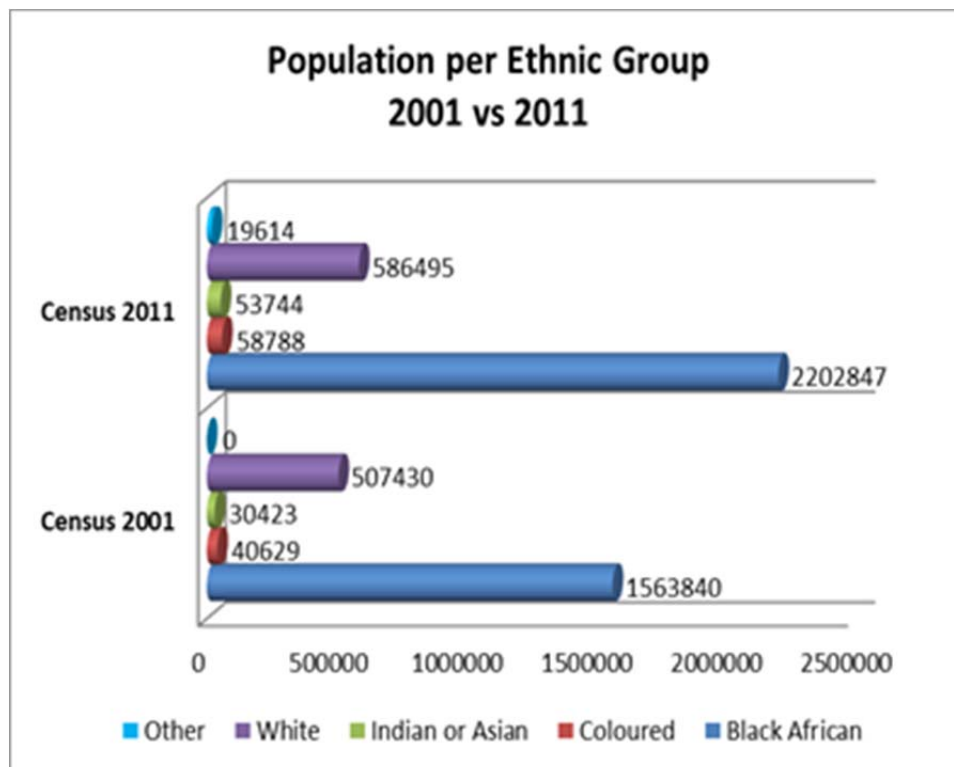
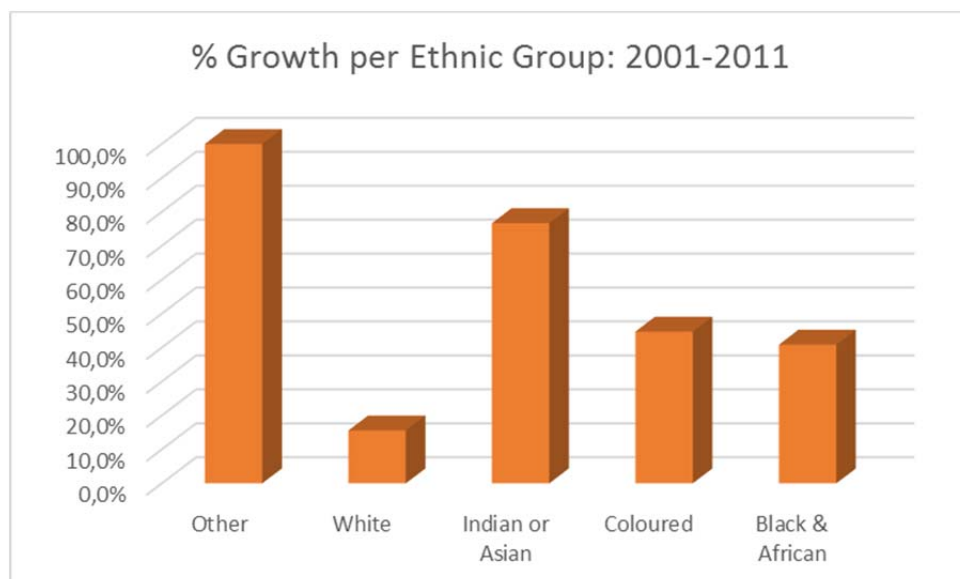
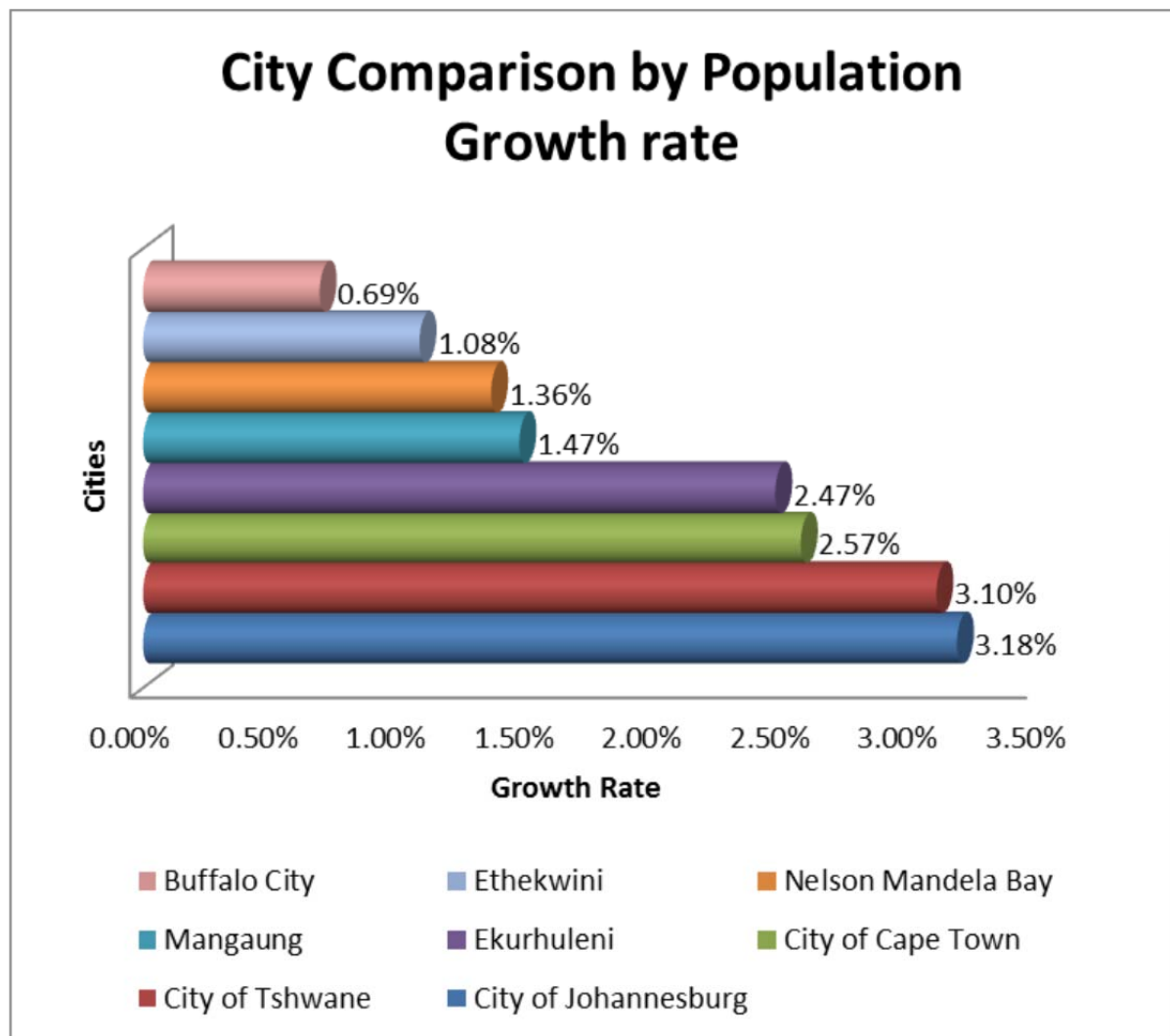


Figure B-16: % Growth per Ethnic Group 2001-2011



It is important to note the population growth rate of Tshwane in relation to other major cities in South Africa. Figure B-17 shows that Tshwane sports the second highest growth rate among the major cities of South Africa. This should not be a surprising finding due to Tshwane's strategic location in the economic hub of the country and in close proximity of two other major metros and the main nodes of job opportunities within the country.

Figure B-17: Population Growth Rate per City in South Africa



Of significant note is the breakdown per administrative region of this population growth as shown in Figure B-18. It shows a disproportionate growth in Region 7, in comparison with the other regions, which is worth some further investigation. Region 7 includes the “far eastern” areas of Tshwane (Bronkhorstspuit, etc.).

The challenge for Tshwane going forward would be not to simply respond to these trends by trying to keep up with service delivery and housing, but to find ways of channelling the settlement of people in an economically sustainable way to alleviate some of the financial burden to accommodate the rampant growth. A comprehensive and integrated growth and infrastructure investment strategy should seek to realise these outcomes.

Figure B-18: Population Growth Rate per Tshwane Planning Region

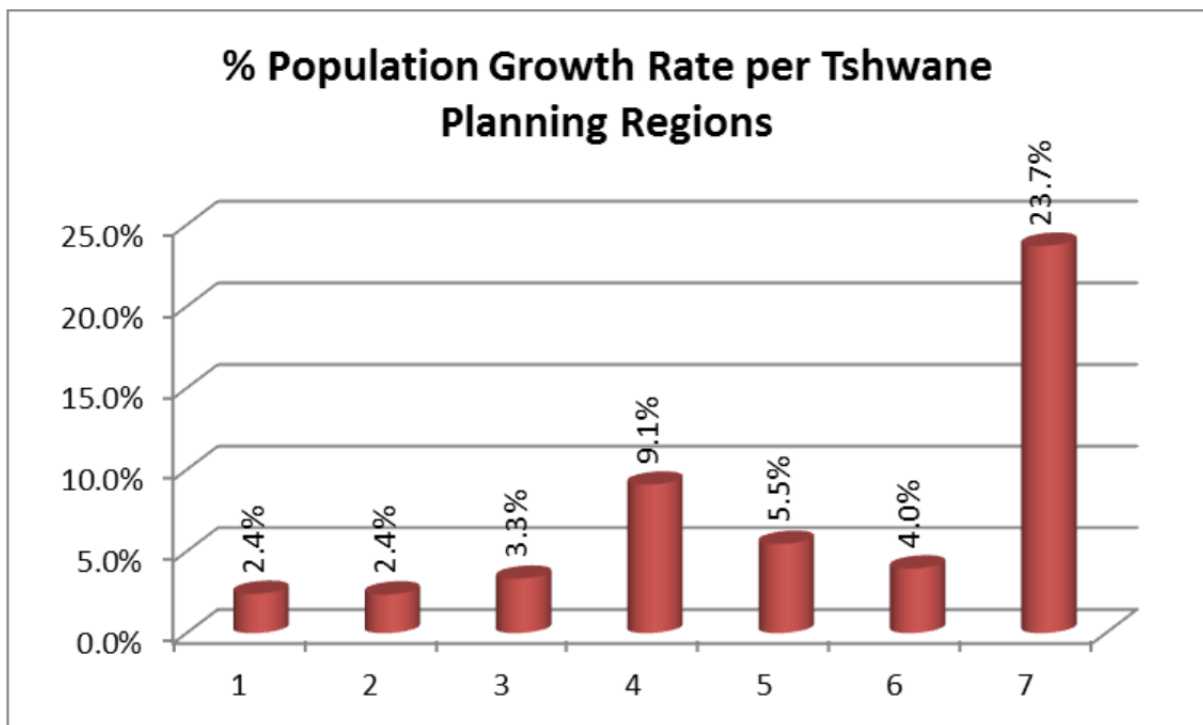
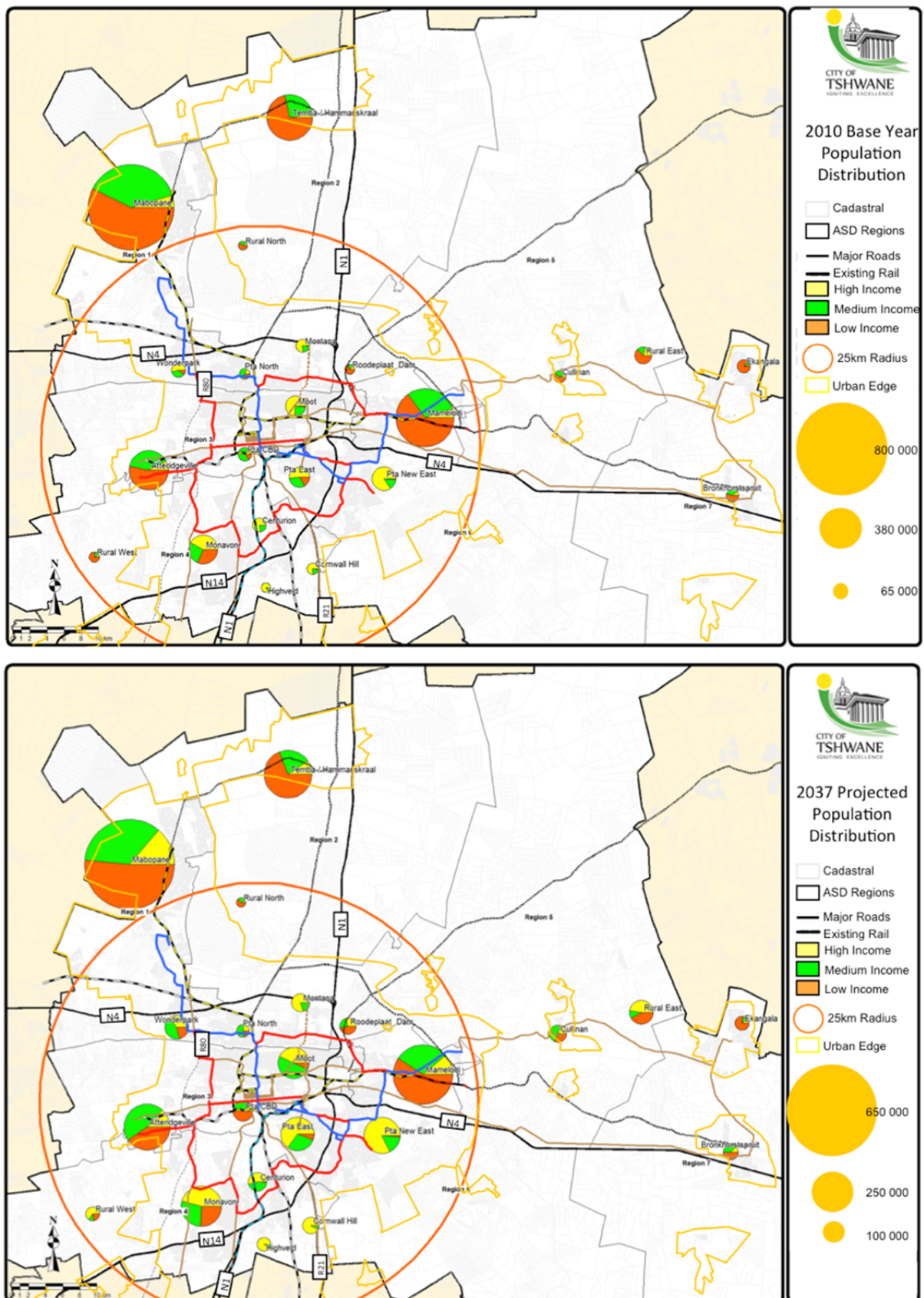


Figure B-19 offers a different view of the 2010 and 2037 Projected Population Distribution. The ideal of eventually achieving a compact city to obtain economies of scale on the various aspects pertaining to achieving maximum economic return on investment appears to be virtually unattainable. The geographic scale of the city and the historic settlement patterns offers major challenges that are established and cannot be changed nor can it be ignored. The Western model of starving investments from “far-flung” or “sprawling” areas will not work here. Investment and upliftment have to continue in the areas dominated by the poorer segments of the population – this is counter the techniques usually used to work towards a compact city.

The solution therefore appears to lie in a combination of measures. Firstly, the areas that are far from each other needs to be brought closer by connecting them with an efficient and affordable transport solution. This strategy is already receiving a lot of attention and is enshrined in the recently completed Integrated Rapid Public Transport Network (IRPTN) Operational Plan of 2014 and the soon to be completed Comprehensive Integrated Transport Plan (CITP) of Tshwane for 2015. A second strategy would call for the development of strong nodes within each area to in effect create a mini-compact city in each area, which in turn can be allowed to grow and be connected to other, similar growth nodes, thereby unlocking the potential towards achieving the goals as articulated by the Tshwane Vision 2055 document.

Figure B-19: 2010 Base Year and 2037 Projected Population Distribution



B.1.1.4 Socio Economic Overview

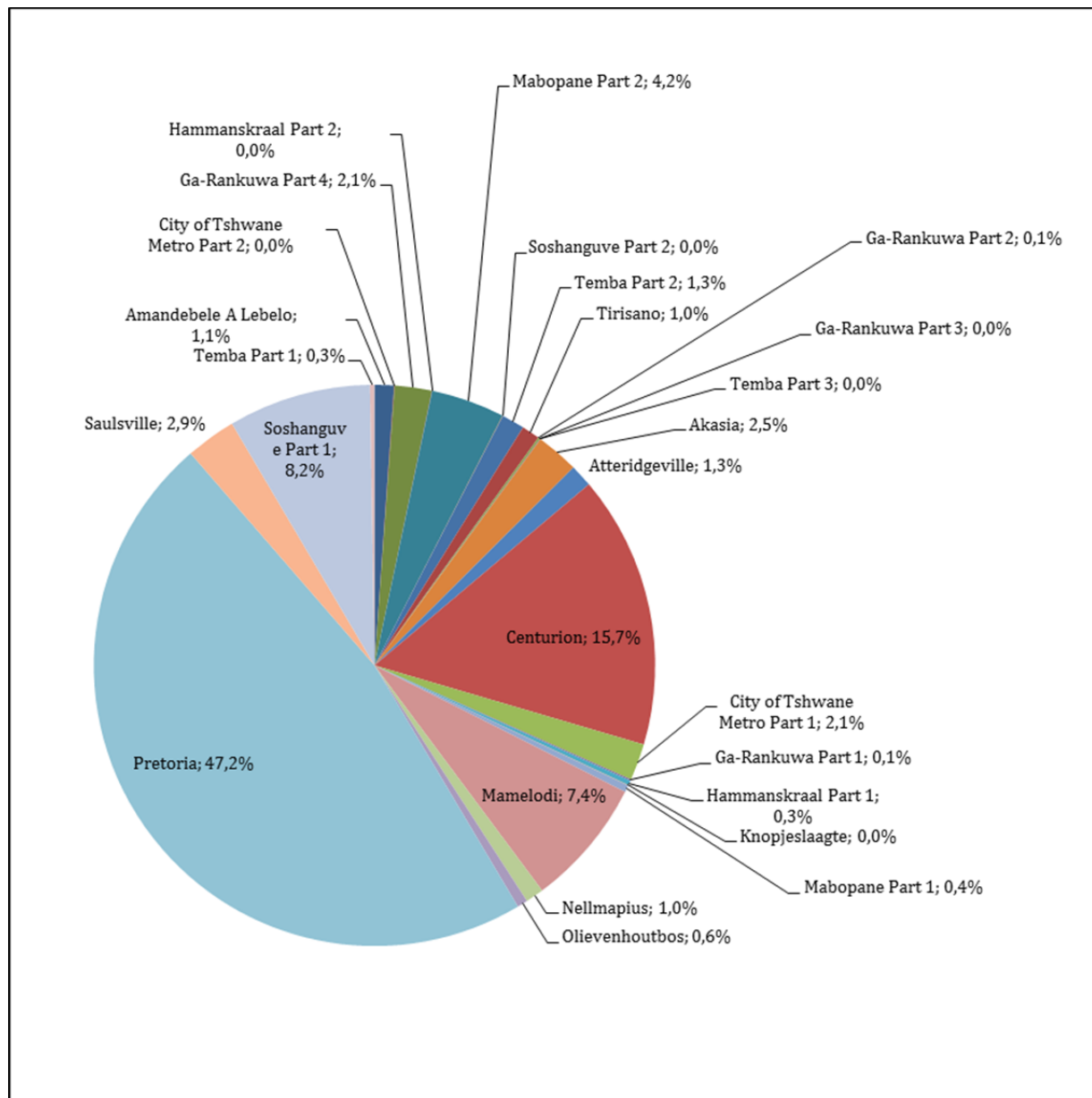
The municipality's main economic sectors are community services and government, followed by finance and manufacturing. Metal products, machinery and household products are the largest sub-sectors within manufacturing. Tshwane's economy contributed 27% to Gauteng's GDP and 9% to the national GDP in 2011. Also in the same year, Tshwane contributed 22,2% to South Africa's total exports and 15, 9% to its total trade.

Figure B-20 shows which localities within CoT are the most significant producers of goods and services. Pretoria is the largest contributor, with an overwhelming 47 per cent of total output (which is largely dominated by general government services), followed by Centurion (16 per cent, which is predominantly due to finance, insurance, real estate and business services), Soshanguve Part 1 (8 per cent, also a general government services hub) and Mamelodi (7 per cent, also a general government services hub). Further on in this section of the report, projected growth is showing a dramatic shift in growth towards emerging nodes whilst the CBD, although showing growth as well, remaining fairly static relative to the growth that will be observed at some of the other nodes.

With respect to the predominant industries in Tshwane, Figure B-21 shows that the general government services industry is the largest economic role-player nearly a third of total Gross Value Added (GVA). This is closely followed by the finance, insurance, real estate and business services sector (25 per cent of GVA), and the manufacturing industry (15 per cent). This clearly highlight one of Tshwane's major economic strengths – that of being a government hub on a national level. Strategies around the investing in the future growth of Tshwane therefore need to seek ways to continue to make it attractive for government to reside and grow its presence in Tshwane. Recently, for instance, the Pan African Parliament was established in Midrand in Johannesburg. Tshwane needs to find ways to enhance and entrench the attractiveness of the City as being the government hub of South Africa.

Going forward, ways need to be found to start connecting the main hub of the CBD with some of the more eminent, emerging hubs to cross-pollinate the growth potential and to create new opportunities within these nodes and along the corridors that would be required to connect them. The other main sectors as shown in Figure B-21 also need to have specific strategies in support of their growth. There appears to be a healthy balance between office work and services, manufacturing and retail. Each of these have specific areas where they dominate and specific catalytic interventions that would facilitate and assist with the growth of these industries.

Figure B-20: GVA shares per locality (constant 2005 prices), 2011



Further thought should also be put into exploring the possible growth of some of the more minor services that are listed Figure B-21. There are huge areas of agricultural land-use within the municipal boundaries of Tshwane yet this sector only make up a very minor contribution to the gross value add of the city's economy. Investing in innovative blue drop and green drop initiatives may propel this sector forward and create additional jobs within the sustainable economy sector.

Figure B-21: Shares of sectorial output (GVA@bp, 2005 prices) for the City of Tshwane, 2011

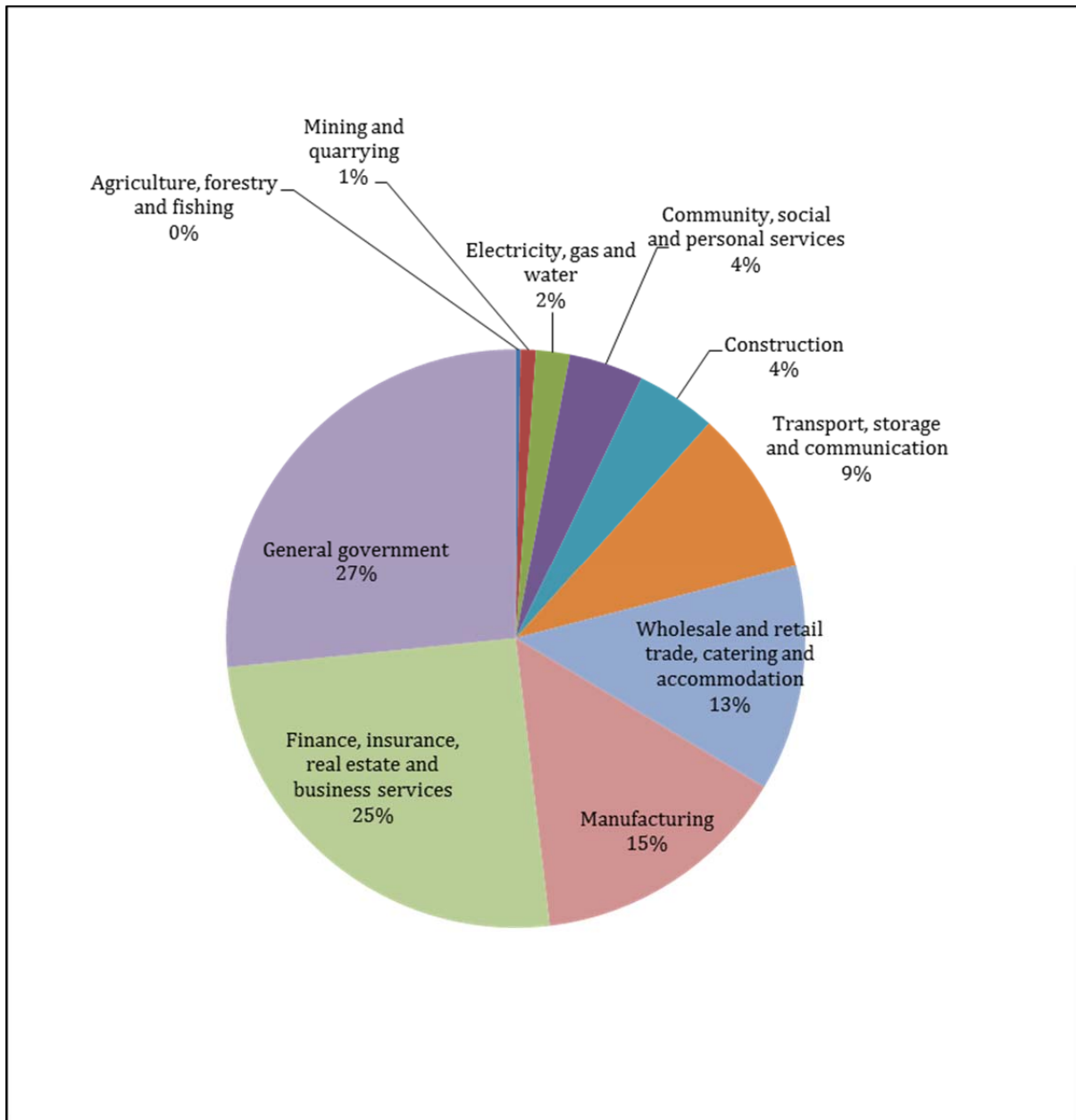
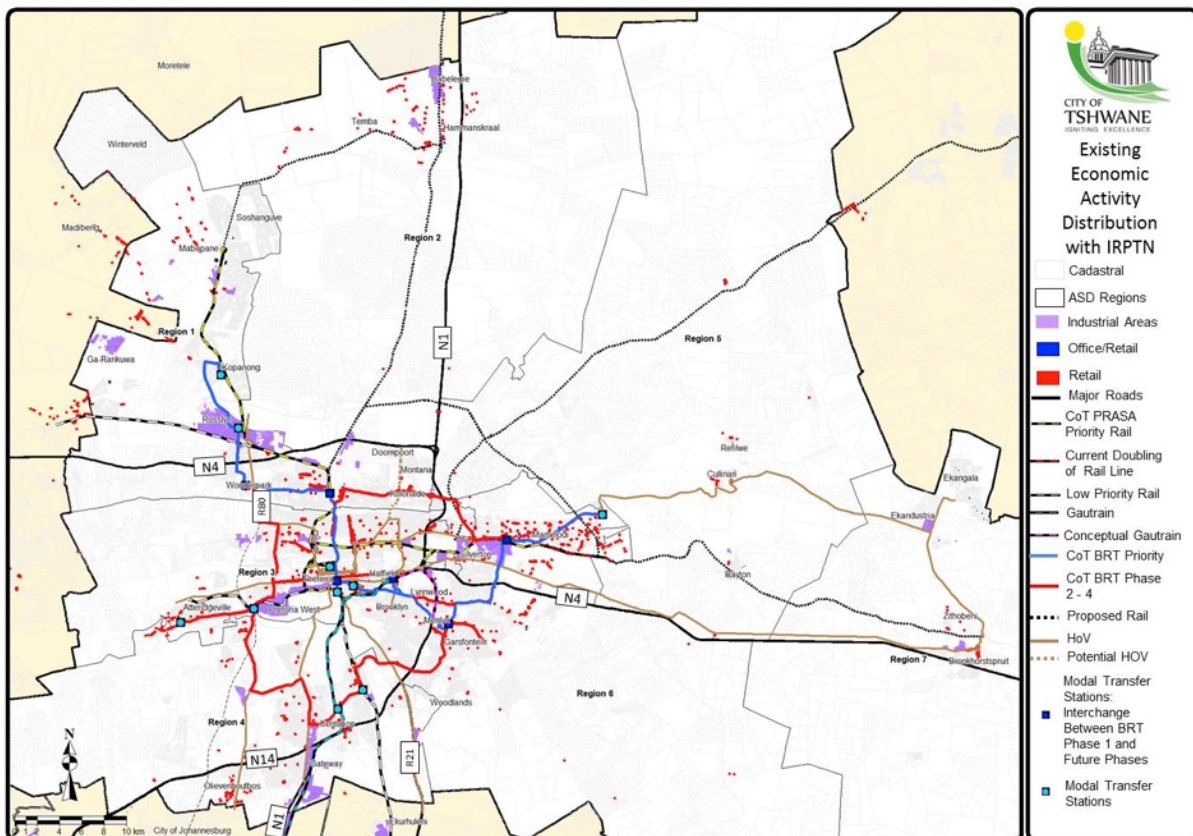


Figure B-22 shows the industrial, retail and business (mixed office and retail) footprint of the City of Tshwane. From this it is evident that retail and office functions are widely distributed throughout the metropolitan area. In previously disadvantaged areas like Olievenhoutbosch, Atteridgeville, Mamelodi, Ga Rankuwa, Mabopane and Temba, as well as the Moot area north of the Tshwane CBD, retail activities are clustered along activity strips like Maunde Drive, Tsamaya Road, Van der Hoff Street, Voortrekker Road and Paul Kruger Street, but also at a much finer grain on business premises (e.g. spaza shops) within residential suburbs.

Figure B-22: Visual Overview of Existing Economic Activity in Tshwane

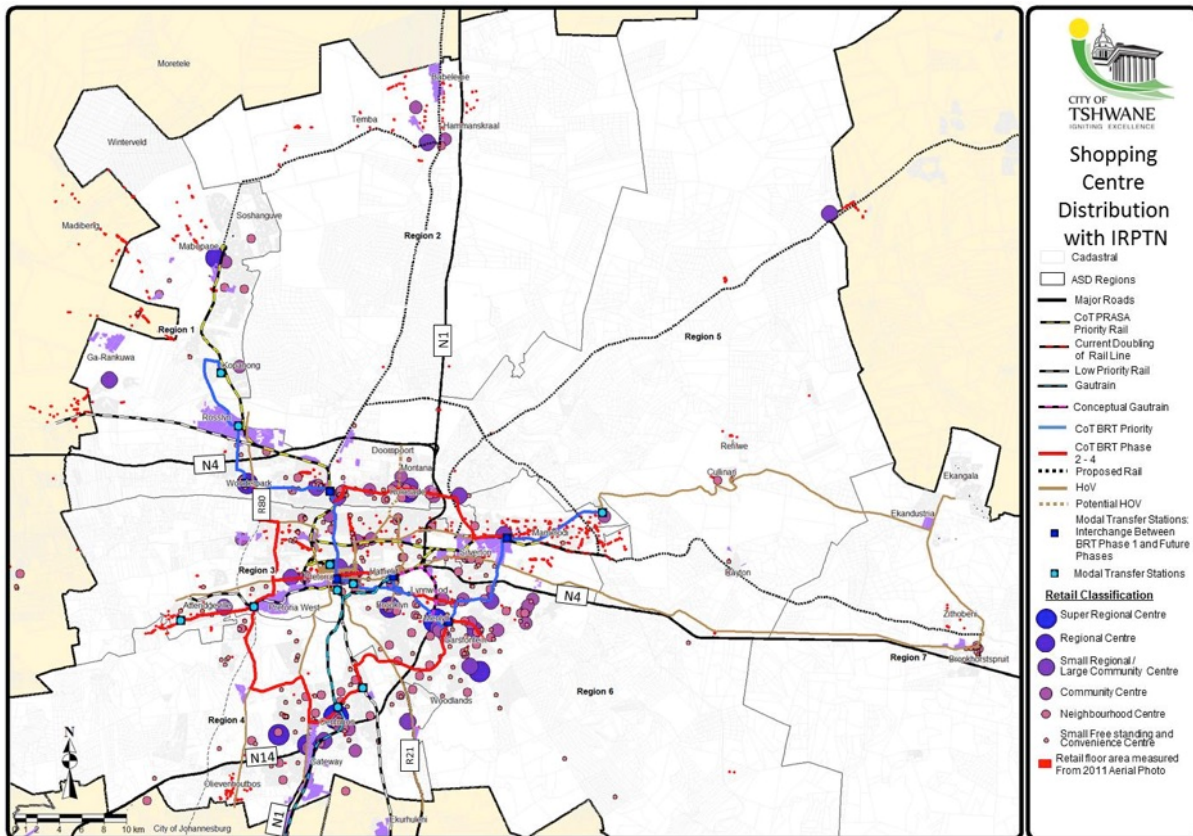


In the southern and eastern suburbs of the City the retail and office functions are also located along some of the major transport corridors e.g. Lynnwood, Atterbury, Lenchen etc., but such activities are mostly consolidated within a hierarchy of mixed-use shopping centres ranging from small convenience centres to super regional centres.

Industrial Activities are mainly clustered along the N1 to the south (Gateway) and Sunderland Ridge, Pretoria West to the west of the Inner City, Koedoespoort-Waltloo towards the east, and Rosslyn, Ga-Rankuwa and Babelegi towards the north-west and north.

Figure B-23 illustrates the spatial distribution of the hierarchy of shopping centres in the City as well as the retail/office footprint not located within the shopping centres. Combined with the industrial areas these represent the major concentrations of economic activity and job opportunities in the City.

Figure B-23: Shopping Centre Distribution with the City of Tshwane



The job opportunities for some of the greater nodes within Tshwane are shown Figure B-25. The major shift or jumps in job opportunities in future gravitates (under the assumption that everything will remain equal in terms of transport and the like as it is now), towards the south, the east and the north of Tshwane. This strengthens some of the views that are expressed in section B.1.1.3 of this BEPP that some each growth node in Tshwane should be encouraged to grow further, to allow densification to take place around these nodes. A single core node (compact city) is not a realistic outcome in the context of Tshwane. Figure B-24 shows the sectoral employment for the city of Tshwane. The sectoral allocation as shown provides evidence for a selection of core industries in CoT namely: general government services; finance, insurance, real estate and business services; and manufacturing.

Figure B-24: Sectorial employment in the City of Tshwane, 2011

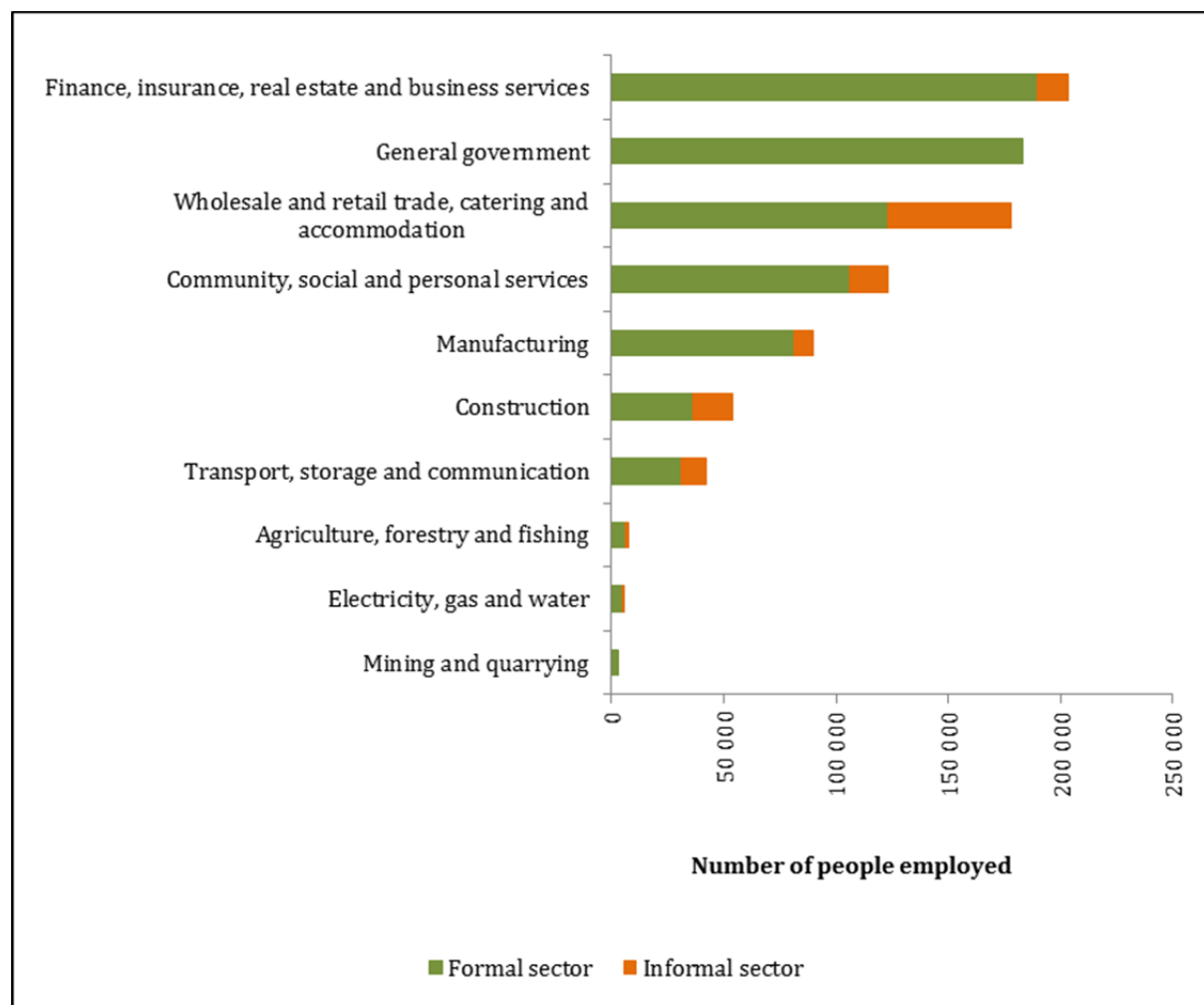


Figure B-25: Tshwane Major Nodes - Existing (2010) and Projected (2037) Job Opportunities

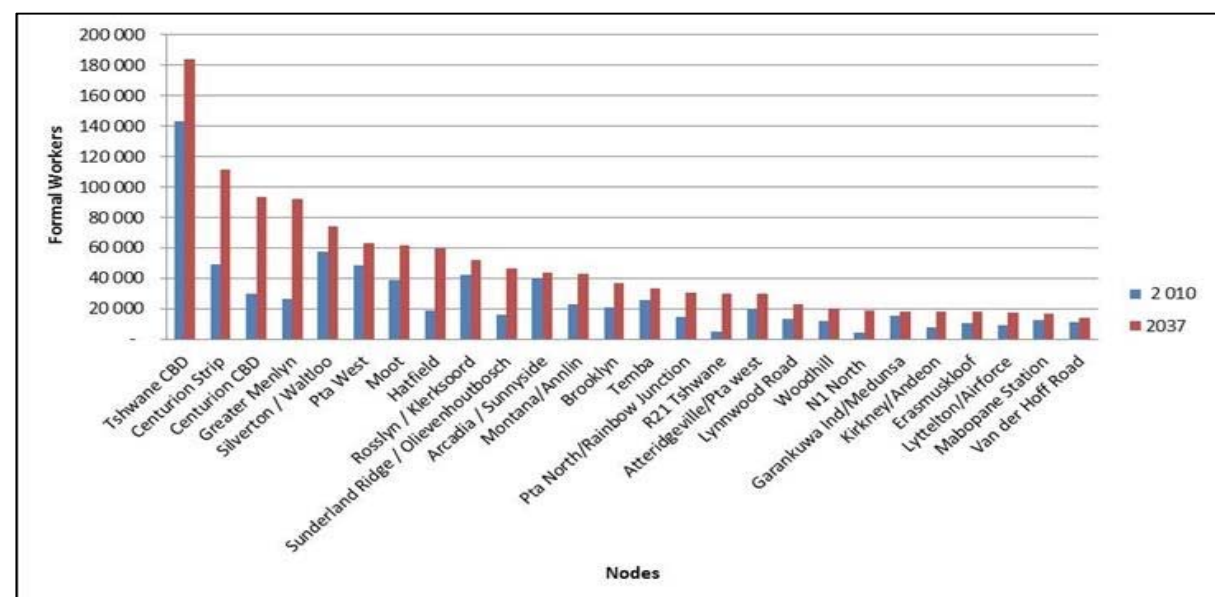
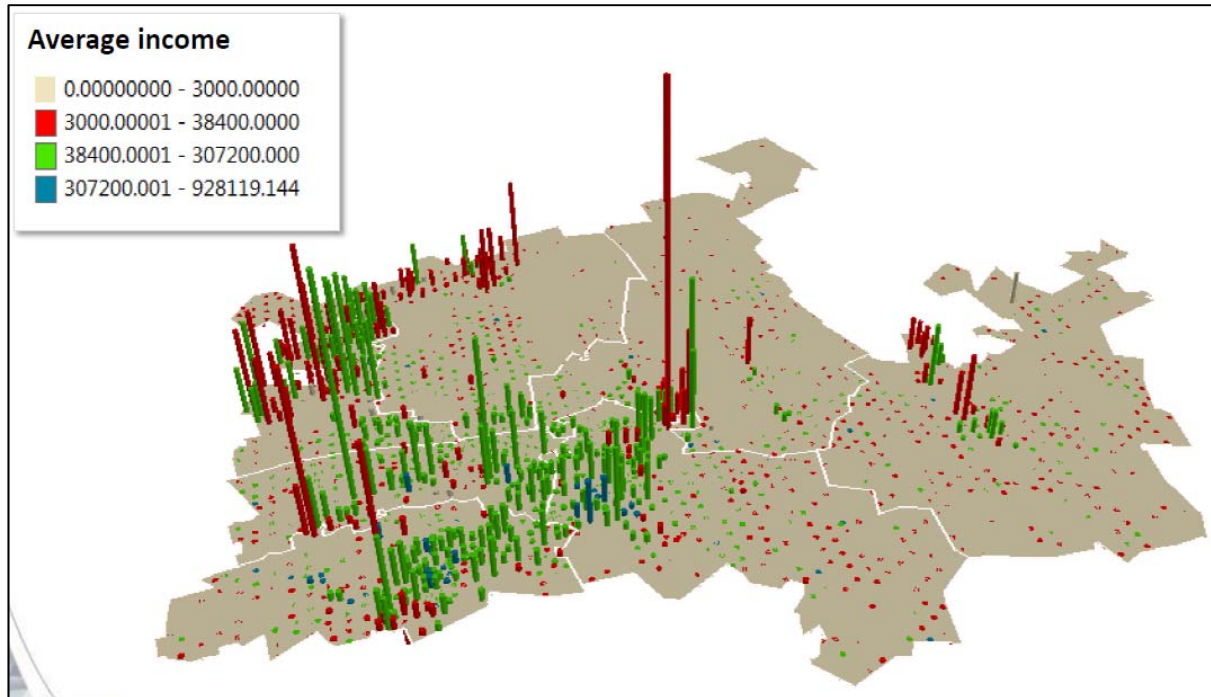


Figure B-26 shows the growth by income over the whole of Tshwane. It shows that there has been a strong growth towards the core areas of the city comprising of the middle-income group mostly. The average household income per annum increased from R94 908 in 2001 to R182 822 in 2011.

Figure B-26: Growth by Income (20101-2011)



Growth in the poor income group is most notable around the peripheral areas of the city. The growth in low-income households provide a more encouraging picture as shown in Figure B-27 below. It still shows that low-income households mostly settles on the outskirts of Tshwane. But is also reveals a settlement trend that starts to move closer to town. To align with statement made earlier in this BEPP, the areas such as Soshanguve, Garankuwa, Atteridgeville and Mamelodi are entrenched. Even though some of these areas are far from the main areas of economic opportunity, the volume of people and the housing provided is a reality and needs to be supported through investment from the City.

The low-income households as shown in Figure B-27, are particularly vulnerable to the cost of transportation thus emphasizing the need to provide affordable, quality transport solutions to these areas in particular. A further strategy, in line with the latest State of the Province address that calls for the specific support and upliftment of the so-called township economy (micro-enterprises), would be to stimulate the growth of business and economic opportunities within these areas itself, thereby decreasing the need for transport over longer distances which erodes quality of life and access to disposable income.

Figure B-27: Growth in low income Households 2001-2011

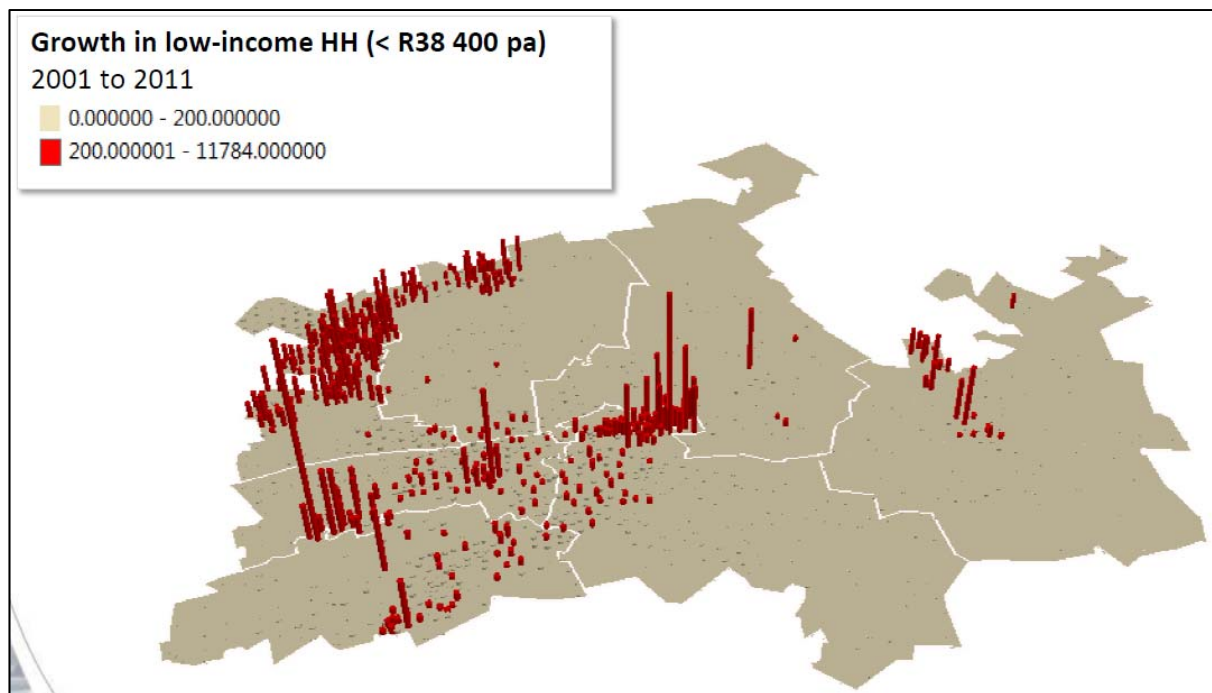


Figure B-28 shows the growth in medium income households between 2001 and 2011. It shows that in this group, more settlement is taking place towards the “older” areas of Tshwane that are located in closer proximity to the CBD and other areas of economic opportunity.

Figure B-28: Growth in medium income Households (2001-2011)

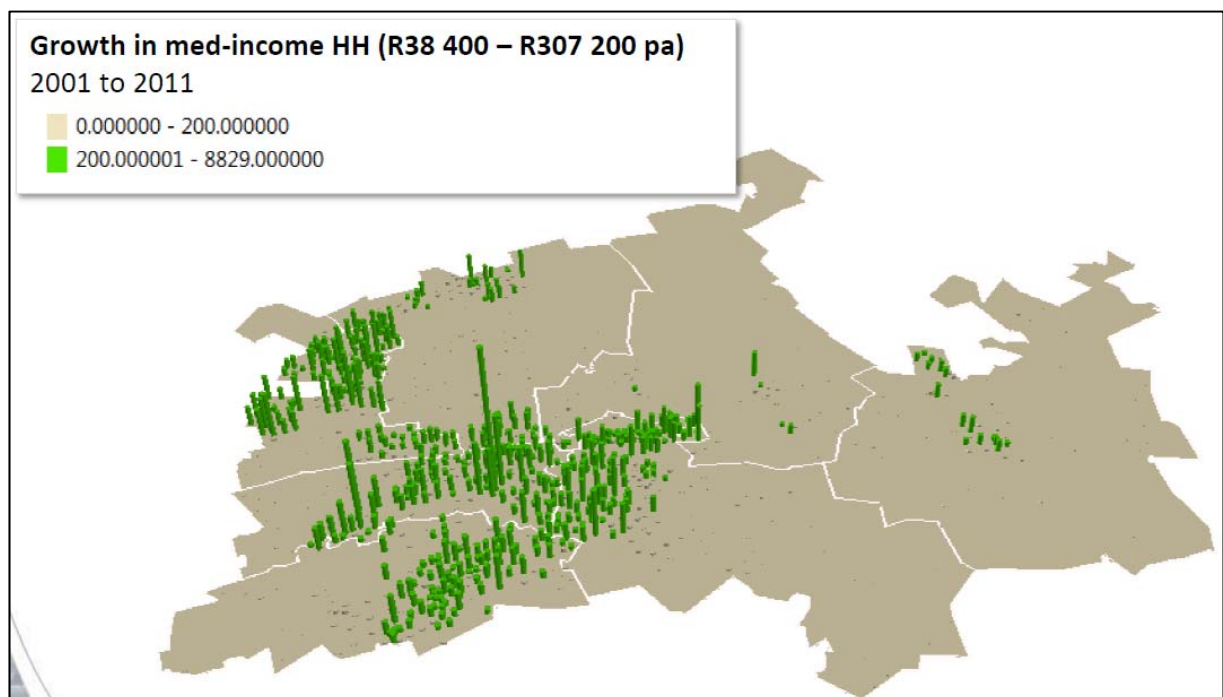
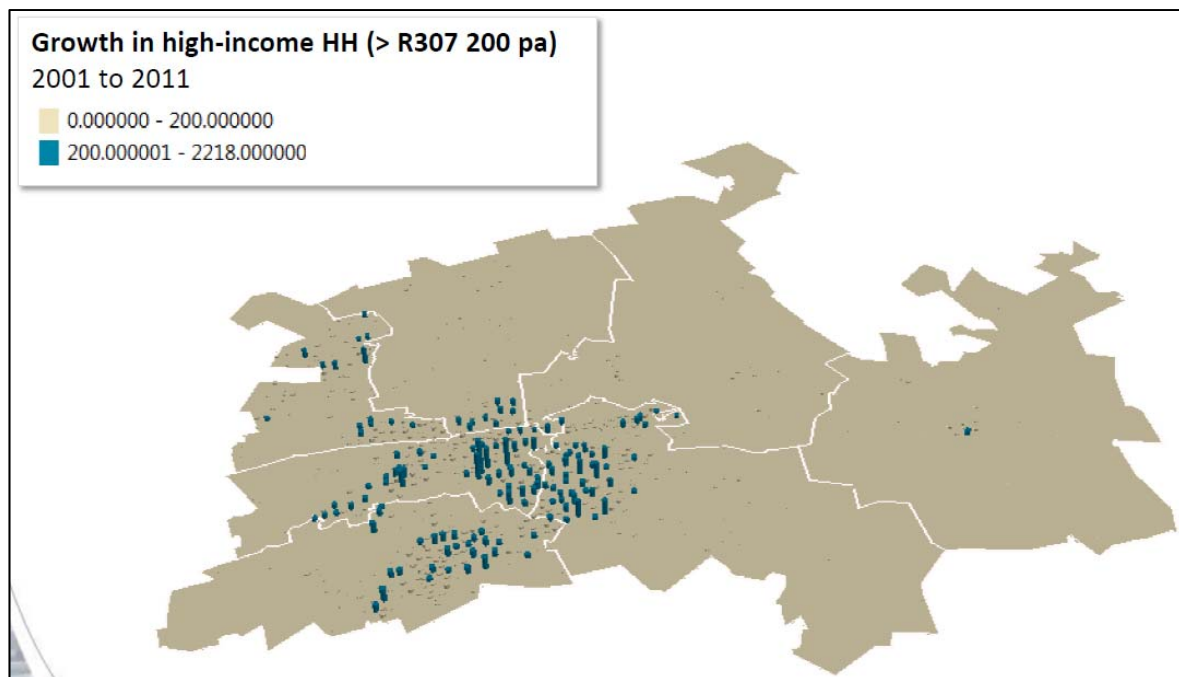


Figure B-29 shows the growth in of the high-income households between 2001 and 2011. The growth in this segment has been the lowest. There are no particular outliers of note.

Figure B-29: Growth in high income Households (2001-2011)



It is important to keep in mind that this segment also needs to be looked after and growth in this sector also needs special attention. The high-income households are contributing significantly to the cities rates and taxes and are usually the sources of enterprise and business that features among the main drivers of the economy. Tshwane is located in close proximity to competing economies and should therefore be competitive in attracting capital and enterprise towards the city. Strategies to protect and grow this segment of households is very important.

Figure B-30 shows the distribution of jobs in Tshwane in 2001 and in 2011. It shows some interesting growth in different areas of Tshwane. Very encouraging is the growth in areas that in former figures was shown to also house the most substantive growth in low-income households. Some of the rather radical spikes in job growth are hard to rationalise without having access to the root data behind it.

Figure B-30: Distribution of jobs 2001 and 2011

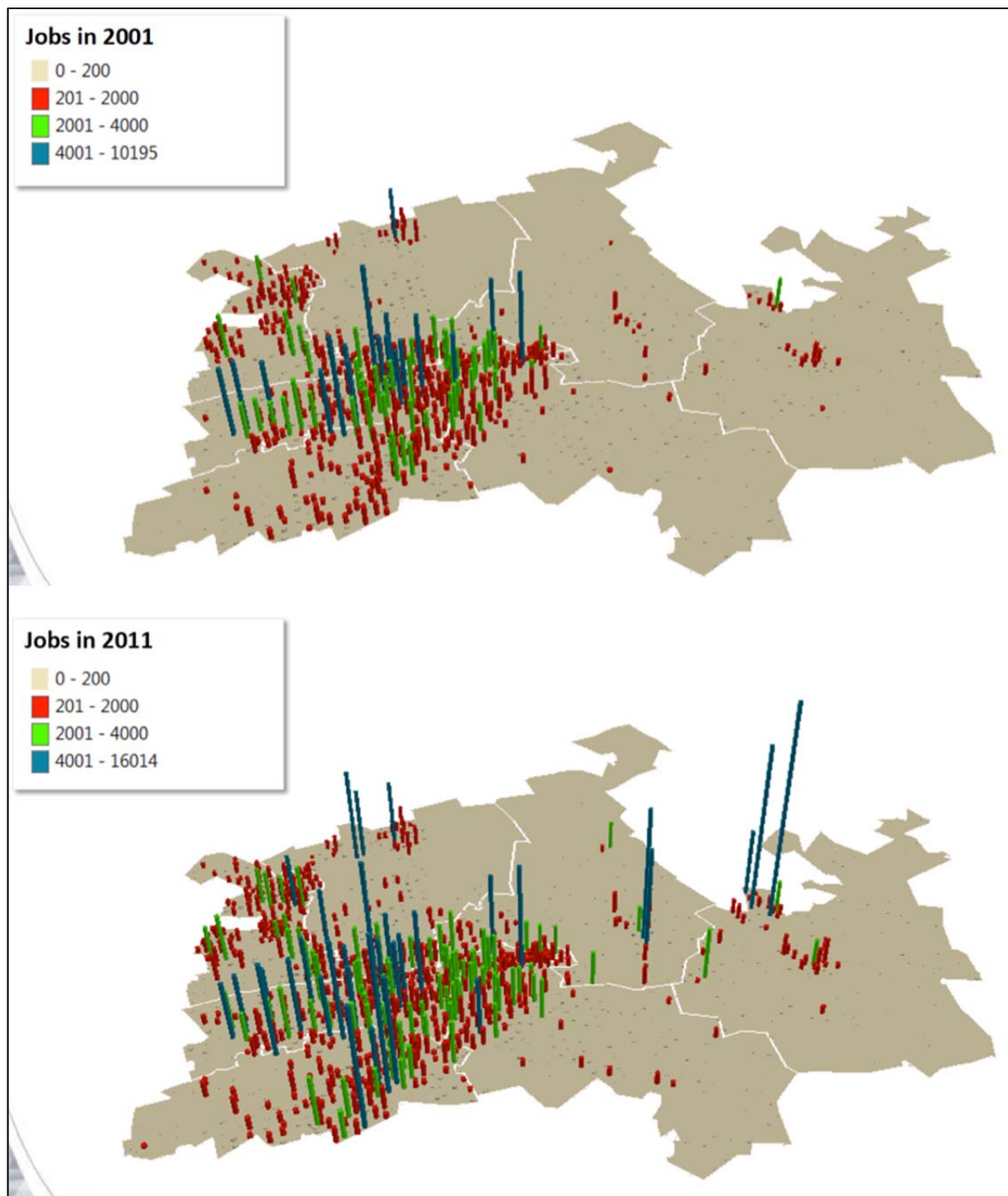
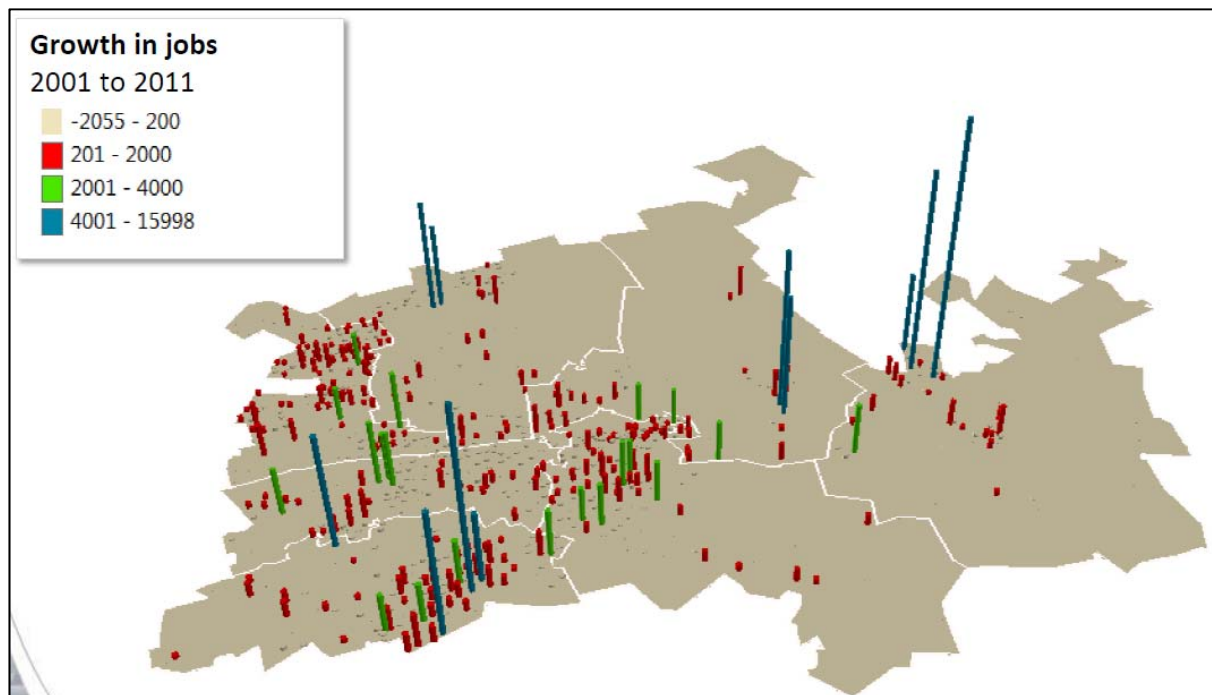


Figure B-31 shows a different perspective of the same data. The growth in jobs appears to have taken place substantively in very specific places in Tshwane. Areas in the north, east and south of Tshwane showed significant growth. The CBD area however have shown very little growth over the decade that it was measured. This appears to substantiate the deductions made earlier in this BEPP that going forward, the growth in jobs in Tshwane will occur in areas other than the CBD. It

therefore once again underlines the importance of focusing investment and strategic interventions towards new, emerging growth nodes.

Between 1996 and 2001, the unemployment rate across this municipality increased by 7, 3%, with an average of 24, 3% to 31, 6% respectively. In 2011, the unemployment rate dropped to 24, 2% which is 0, 1% lower than the unemployment rate in 1996. The increase in jobs shown in the figures referred to in this section provides substance to an evidential growth in Tshwane's economy.

Figure B-31: Growth in jobs (2001-2011)



The fact that the overall level of employment appears to have stagnated over the past 15 years is more a function of the human influx into Tshwane. The job-market simply could not keep up with the radical increase in the demand for new job opportunities. If Tshwane simply had to cope with its own, inherent growth, the percentages of unemployment and growth would have been more positive.

B.1.1.5 Tshwane's Basic Services Overview

The basic services are an enabler for economic opportunity and growth within the City of Tshwane. Each of the basic services will be reported on separately below.

B.1.1.5.1 Electricity

Since 1996, the proportion of households using electricity as the main source of energy for lighting, heating and cooking increased across the City of Tshwane. 88, 6% of households used electricity for lighting in 2011. This was an increase from 79, 9% in 2001. More households were using electricity

for cooking in 2011 (84, 2%), this was an increase from 70, 5% in 2001. The number of households that were using electricity for heating was 73, 5% in 2011, an increase from 69, and 35% in 2001.

B.1.1.5.2 Piped water

In 2011, there was an increase of 89, 2% in the proportion of households with access to piped water in their dwelling or yard, compared with 79, and 7% in 2001. The proportion of households with access to piped water on a communal stand decreased to 7, 4% in 2011 from 15, and 5% in 2001. The number of households with no access to piped water decreased to 3, 4% in 2011 from 4, and 8% in 2001.

B.1.1.5.3 Refuse removal

The proportion of households whose refuse was removed by the local authority or a private company was 82% in 2011, which is an increase from 78, 7% in 2001. The percentage of those with communal refuse dumps was 14, 1% in 2011, which is a decrease from 17, 4% in 2001, while those who had to remove their refuse themselves was 3, 3% in 2011 compared with 4% in 2001.

B.1.1.5.4 Toilet facilities

In 2011, 79, 4% of households in City of Tshwane had flush or chemical toilets (an increase from 71, 5% in 2001). On the other hand, the number of households with no toilet facilities was 1, 3% in 2011, which is a decrease from 3, and 1% in 2001.

B.1.2 Impediments to Growth and Development in Tshwane

B.1.2.1 Adequacy of Capital

There are many aspects that underline growth. In the world of economy, the relationship between these elements are modelled and scenarios are built to test the outcomes of specific interventions. At the root of an enabling environment though, is access to funding and capital. Tshwane recently started making use of a system called CaPS that aims to provide the city with a capital projects planning, prioritisation and management tool. The use of the system is still in its infancy but its full and ultimate use will provide the city with the ability to align the capital expenditure with the actual capital needs and with the city's objectives and strategies in a balanced manner.

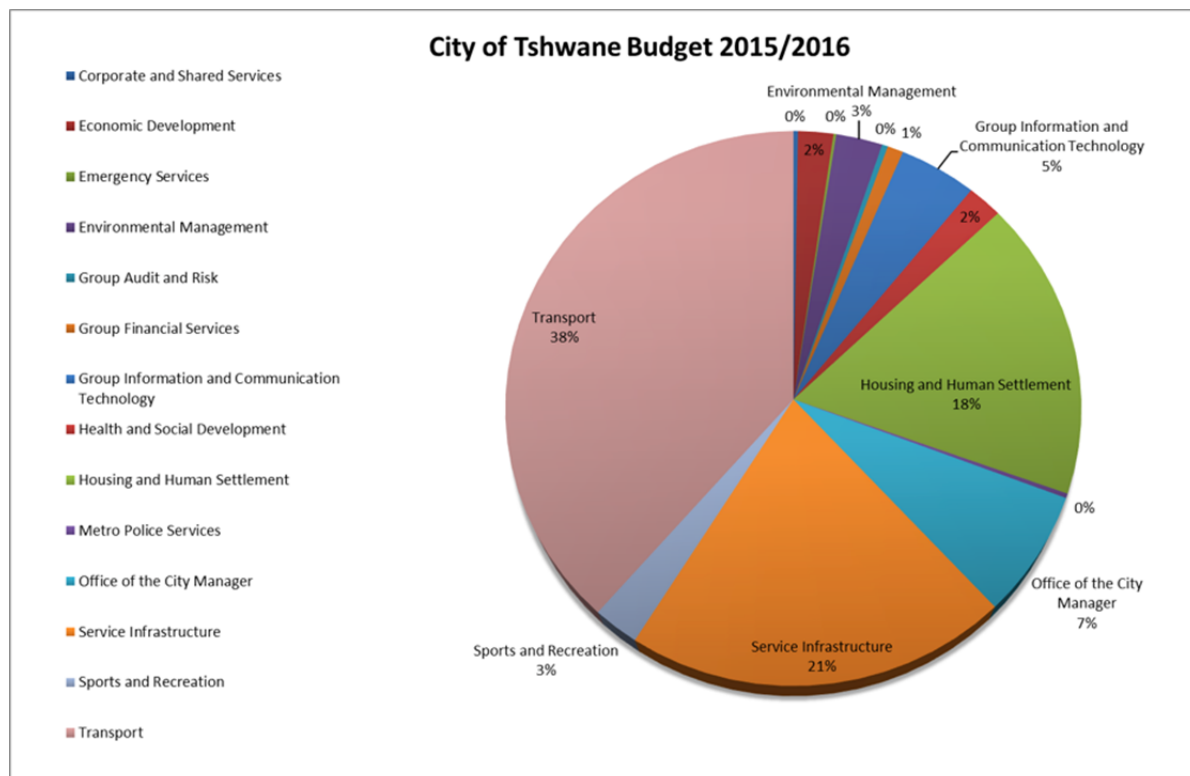
The ultimate outcome that is desired is to get a comprehensive overview of the city's capital needs. The current project budgets and capital needs that were captured using CaPS, are a reflection of the MTREF (medium term revenue and expenditure framework). The numbers therefore do not reflect the actual capital needs of the city in the long term. The actual capital needs should stem from masterplans that are developed by each department that shows the current status of its

performance and/or provision of infrastructure within a service area measured against the actual demand and the predicted growth going forward. Form this gap analysis, the actual needs should be derived.

The total capital need should then be compared to the availability and level of funding from various sources. In so doing the calculated backlog could then be divided by the rate of funding to determine the period (number of years) it will take to eradicate the backlog or to bring it down to acceptable levels. This understanding is vital in the prioritisation of capital going forward. It may, for instance point out that some of the departments within Tshwane need to receive disproportionate allocations of the overall budget in order to align an enabling economy in the short term. The objective would be to include the beginnings of a backlog calculation in the next version (2016/17) of the BEPP.

Figure B-32 shows the allocation of indicative budgets across the various department of Tshwane for 2015/16. Ideally to understand one of the major impediments to growth and development in context an additional graph next to the graph shown here, should show the overall capital need of each of these departments to address the need for capacity and the need to grow towards the goals and objectives as outlined in the Tshwane’s IDP and Vision 2055 document. A good understanding of this very fundamental impediment to growth and development is unfortunately not available yet for this version of the Tshwane BEPP.

Figure B-32: Indicative Budget Allocation from CaPS for 2015/16



B.1.2.2 Alignment of capital with the city's needs and objectives

Currently, many of Tshwane's capital needs stem from the need to provide capacity to meet the demand. There are also a couple of strategic projects that stem from specific interventions that were planned and executed by the city. The bulk of projects are however reactive to address the most urgent needs. The ideal would be to tip the balance of capital needs more towards being proactive than reactive. In other words, capital should increasingly be directed towards addressing the vision and objectives of the city. This can only be achieved if the backlogs are addressed adequately.

Service backlogs should be managed from two sides. One strategy would be to direct more funding towards the infrastructure required to address these backlogs. The other (and often neglected) strategy would be to find ways of reducing the backlogs by managing the demand that underpins these backlogs - for instance, if effective densification around transport corridors can be achieved, this would minimise the need to invest in infrastructure that must keep up with the sprawling housing settlements that are far away from the key transport corridors.

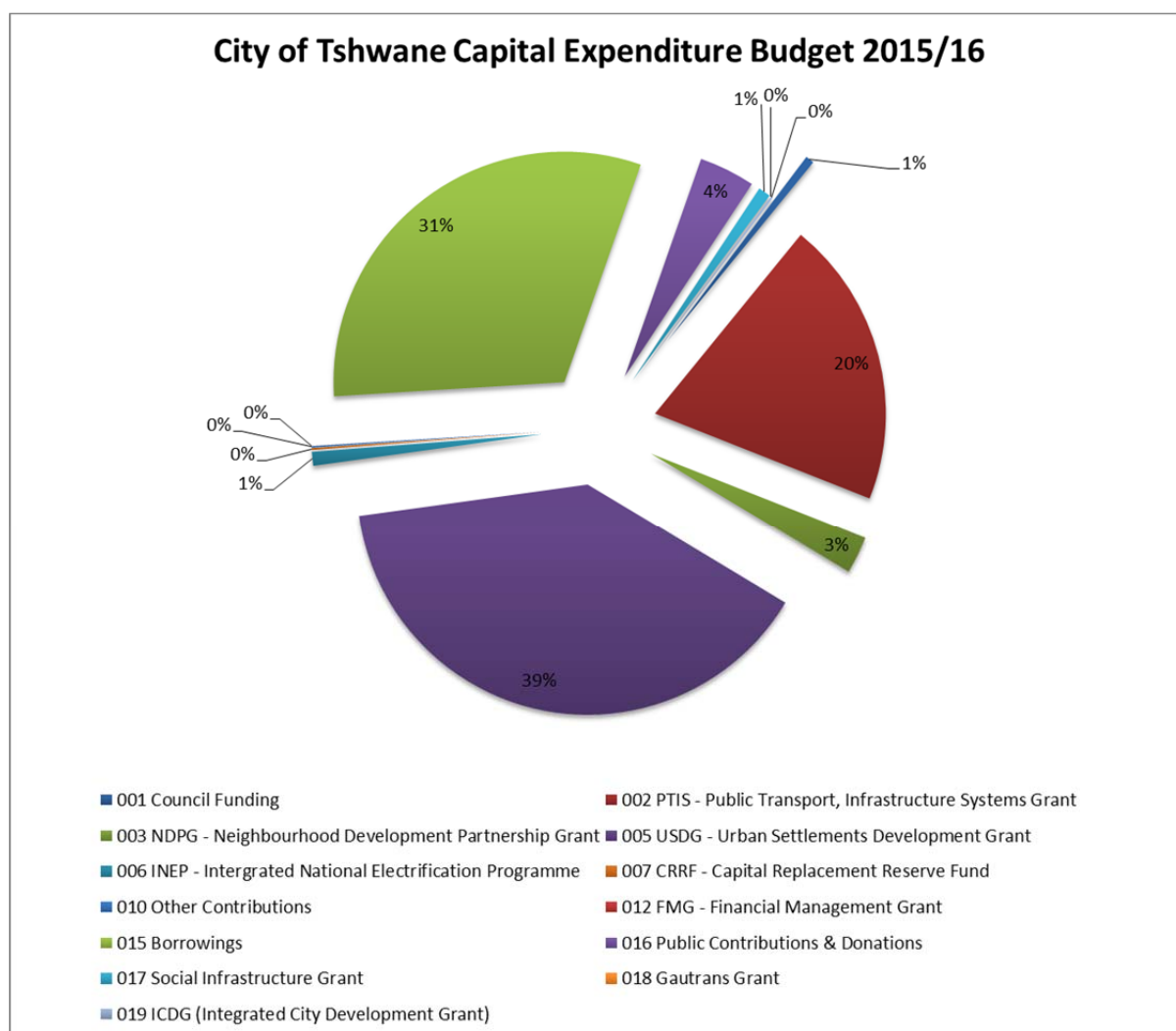
B.1.2.3 Understanding the demand

A major impediment to growth and development is a comprehensive and holistic understanding of the actual demand for services and the drivers of this demand. A cursory view tempts one to arrive at the simplistic solution that the demand is simply driven by the city's growth and human immigration. There are however a number of structural problems that are embedded in the city's layouts and land-use. Densification and restructuring of human settlement needs to take place. In some instances, Tshwane simply has to provide an enabling environment in terms of the provision of bulk services capacity, to allow this to happen. In other instances, Tshwane needs to affect more radical interventions to bring about the change that is required to achieve the necessary economies as articulated in the Vision 2055 document.

B.1.2.4 Sources of Capital

The current 2015/16 capital budget for Tshwane amounts to approximately R3.8bn. The sources of this funding are listed in Figure B-33.

Figure B-33: City of Tshwane Capital Expenditure Budget 2015/16



The concern with the current sources of funding within Tshwane is that it is very grant dependant and only a very small amount of Tshwane's own capital features in the overall funding of capital needs. There are good reasons for this – it does however impose a major impediment on growth and development going forward. Strategies need to be put in place to:

- Start alleviating the burden on Tshwane's internally generated capital,
- To increase the rates base feeding the internally generated capital

This would provide the city with more freedom and independence to forge ahead with its own vision, mission and underlying objectives. It will also accelerate the rate at which infrastructure gets implemented towards the achievement of the city's goals.

B.1.2.5 Tshwane Trends and Pressures

From section B.1.1 of this report, certain trends and pressures emerged. These trends are discussed in the detail in section B.1.1. The key aspects that were identified that present challenges are expanded on below.

B.1.2.5.1 Immigration

The rate at which people are migrating towards Tshwane is largely out of Tshwane's control. The constant influx of people does however impose a significant burden on the economy of Tshwane. The job market does not have the ability to absorb the growth that is imposed by this influx. Furthermore, the capacity of the existing bulk infrastructure is inadequate to cope with the sudden demand.

B.1.2.5.2 Tertiary education

Tshwane is renowned for its very strong tertiary education institutions. The city therefore attracts a large number of students and this is partially reflected in the age-distribution of the city. The education sector needs to be enabled and strengthened to become an attractor of excellence and skills towards the city, and to provide the sector with the ability to grow and be a major contributor to the revenue and economy of the city.

B.1.2.5.3 Job entrants

The large number of people in the age bracket between 19 and 30 years old in Tshwane is not only made up by students. Another major component of this segment of the population comprise of job seekers and new entrants to the job market. It therefore presents good opportunity to provide institutions that enables a transition into the job market. This may include but will not be limited to artisan programmes, apprenticeships and so on.

B.1.2.5.4 Established settlement patterns

The structural layout of Tshwane is established and not ideal from many perspectives. The city's area is vast and distances between settlement and place of employment are large. The volumes involved with the human settlements are large and will remain in place as they are. The idea of a compact city will therefore remain out of Tshwane's grasp. Alternative strategies should be sought to effectively connect the areas of settlement and the areas of employment with each other in a manner that is efficient and affordable – the city's IRPTN, CIP and LRT studies are all proposing interventions towards addressing this issue. Furthermore, the major areas of employment are all showing emerging nodes and these should be strengthened as well to start addressing the demand for travel across the city.

B.1.2.5.5 Human settlement patterns

Patterns in growth in households were shown for low, medium and high-income households. Each of these sectors are associated with specific needs. The city needs to make itself competitive and attractive towards the economically active sector of the population. This will help to increase the city's rates base, create jobs and stimulate the economy in many ways. A multitude of opportunities are available to the city and concrete strategies and actions are required to give substance to these.

B.1.2.6 Broad issues associated with each administrative region

B.1.2.6.1 Region 1

A significant number of the population has low levels of education, high unemployment, very low incomes and poor living standards. In view of the specialised nature of the industrial areas, there are limited job opportunities for unskilled labourers in the region. In addition to this, the proximity of Limpopo to the North-west region results in a constant influx of people (mostly unskilled and semi-skilled) from these provinces into Tshwane, who generally tend to settle informally in the most northern part of Tshwane which acts as a "transitional zone" for the first wave of urbanisation.

B.1.2.6.2 Region 2

Some of the northern areas within the region are plagued by the problems associated with historic land use and settlement policies and previous administrative boundaries, making township establishment and the benefits associated with this difficult in some areas. Other challenges include the role of the tribal authorities in land management. The infrastructure landscape differs vastly across the region. The southern section is well catered for, while the northern section requires several upgrades in order to support development plans for the area.

B.1.2.6.3 Region 3

The region is the host of several national government departments and forms the administrative heart of government. The CBD is the largest job opportunity zone in the CoT. The region is generally well provided for in terms of service infrastructure. Rapid development is expanding towards the provincial urban edge. Nonetheless, future development may be subjected to future bulk infrastructure limitations. Unfortunately, further challenges exist in the fact that the CBD has lost its status as the focal point of commercial and office related activity within the metropolitan area. This is largely due to the development of a number of high-order decentralised nodes. This has partially led to a gradual process of urban decay within the CBD and surrounding areas.

B.1.2.6.4 Region 4

The region's strategic location along the border of Johannesburg has meant that it has progressively developed further towards the south as the growing attraction to the convenience and economic sense of its location has grabbed the attention of many investors. The Highveld Technopark is one such development that is testament to this.

Apart from infrastructure requirements and development trends, the low densities are also influenced by the underlying dolomite in the area. Vacant areas within the suburban environment have recently developed extensively with densities varying from 60 units per hectare. There still exists an opportunity to extend residential developments in the westerly direction (Monavoni and surrounds). Though well serviced, the provision of bulk services is lagging behind the rapid population growth. Existing infrastructure requires upgrading and maintenance.

B.1.2.6.5 Region 5

Development pressures exist primarily in the southern part of the region where Rayton and Cullinan are located. The strength of the Rayton and Cullinan area is that they are the only two urban centres to be found within the largely rural region. This creates opportunities for clustering and focusing various development initiatives at those specific localities. The intensities of the developments in these localities will be to the level of a secondary node (relative to the existing Metropolitan Cores which represent the primary nodes of the City). In terms of the MSDF, Cullinan is identified as a specialized activity area, specifically a tourism node due to the high concentration of existing and potential tourism activity. Rayton is identified as a small town within a largely rural area. The proposals for Rayton are discussed in the Regional Spatial Framework for Region 5. Development within these areas will also be subject to infrastructure provision capabilities. Currently, significant service backlogs exist.

The vast rural areas have potential for developing into agricultural hubs within the rural management context.

B.1.2.6.6 Region 6

Region 6 is popular in terms of retail as well as office functions as many of the higher category retail and office functions of the City have relocated to this region over the past few years. This region accommodates some of the city's most affluent citizens, though it is important to note that there is a clear distinction between the southern and northern sections of the region: the northern section being less developed and having less economic opportunities and thus a higher unemployment rate. The southern section, on the other hand, continues to develop at a rapid pace, with many investors

vying to locate their businesses in that area. The region as a whole is well serviced, but will eventually require upgrades if the development in the area continues at the same pace.

B.1.2.6.7 Region 7

Region 7 forms the Eastern most part of the CoT and is comparable in size to region 5. Like region 5, Region 7 also consists of a large rural component and includes areas such as Bronkhorstspuit and Ekandustria Industrial area. The region is the gateway to Gauteng from Mpumalanga via the Maputo Corridor.

B.1.2.7 A reduced carbon footprint

Transport is a major consumer of energy, and uses most of the world’s petroleum, thereby creating significant amounts of air pollution, including Carbon Dioxide, Nitrous Oxides and particulates. Road transport is the largest contributor of emissions within the transport sector. This had led to a global call to reduce the Carbon emissions of road vehicles through: improved vehicle efficiency, a substitution towards “greener” electric vehicles, and a transition from air and road to rail transport and NMT – i.e. towards a sustainable public transport network. Not only do transport systems negatively impact the environment through harmful emissions, but also through traffic congestion and urban sprawl, the latter of which can overtake natural vegetation and agricultural land.

B.1.3 Catalytic Urban Development Projects in Tshwane

They key to creating an efficient and sustainable city across such a vast land mass is to implement nodal development strategies. Across these seven regions outlined above, an important distinction is made between four nodal typologies with the highest order being the Capital Core.

METROPOLITAN NODES	<p>are primary nodes of the highest order. These nodes accommodate the highest degree of service specialisation and offer the widest range of services. Often, metropolitan nodes will have regional/provincial relevance. In the Tshwane context, Metropolitan nodes are those nodes within the City (economically) benefiting primarily from the investment of the private sector. Equally important is that these nodes serve as economic hubs and focal points for employment opportunities. The role of the public sector in such nodes is to manage the rate of growth, provide infrastructure in line with the growth management plan and maintain the urban environment. Such localities are also where the most extensive land use rights, including densities, are likely to be supported,</p>
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	in line with the growth management strategy.
URBAN CORES	<p>Urban Cores- former township areas were developed as a result of forced relocation programmes. Inevitably, these townships grew to accommodate large populations of low income or unemployed people. The economic circumstance was clearly evident in the quality of the physical environment. Under the new government which was established in 1994, these township areas were identified, not as a blight in the urban fabric as previously thought of, but as beacons of opportunity, through the human capital that was concentrated within the various communities of the townships. Due to the great need that often belies such nodes, the government has to play a more active role in social and economic restructuring, especially in view of the limited private investment, relative to Metropolitan cores. The Neighbourhood Development Programme (NDPG) is a nationally funded programme that aims to address the improved quality of environment in urban cores.</p>
EMERGING NODES	<p>Emerging nodes- over the past few years, certain economic, social and/or residential opportunities have begun to emerge in various localities in the city. The realisation of these localities into fully fledged nodes will depend on a number of factors. While the future of these nodes is uncertain, the potential for greater development is clear. Identifying future urban areas also provides an opportunity to plan for the provision of new infrastructure and timely planning for growth that is sustainable. Emerging nodes will be managed subject to growth management principles.</p>

GUIDING SPATIAL GROWTH AND DEVELOPMENT: (MSDF 2012 AND RSDFS 2014)

The City of Tshwane approved the MSDF in 2012 and the RSDFS in 2014. These documents provide the spatial strategy of the city at macro and micro level. Maps 5 illustrates the nodal and corridor development concept advocated in the MSDF 2012 and Map 6 further defines the nodal and corridor development concept at a regional level encompassing spatial structuring elements.

The short-medium term key focus areas for development should be contained within the 25km radius from the Capital Core (CBD). Depending on the intensity and pace of development it could even run into the long-term to realize meaningful infill and intensification within the 25km radius. The rationale is based on sustainable development principles, which seek to improve efficiency and maximum utilization of available resources;

-In reality, where development already exists in the periphery (beyond the 25km radius)a maintenance development strategy should be applied in support of developing sustainable human settlements;

-This entails provision of new infrastructure where required, eradication of service backlogs in marginalized communities as well as maintenance of existing infrastructure or re-capitalisation of assets;

-Provision of social infrastructure should be primarily focused on nodal areas in form of multi-purpose centres accommodating a range of services such as health, educational, safety and security, customer care, emergency facilities as well as other state services prescribed to be provided for the benefit of serving larger communities.

Nodal development:

- The city has prioritized and announced on Strategic Nodes for development, namely, the Inner City (West Capital), Centurion CBD, Zone of Choice (Rainbow Junction), Corridor Development (TRT Line 1);

-National Priority development interventions of significance in Tshwane include the Inner City Revitalisation, Rosslyn Automotive Cluster, the Gautrain Stations in Hatfield, Centurion and Pretoria Stations, and the Freight and Logistics Hub in Pyramid linking with the Wonderboom Airport;

-For the *Development of the North*: spatial targeting for impactful development serving regional community interests to support liveability. Main focus will be on nodes to catalyse economic growth in transit oriented spaces such as Mabopane Station, Ga-Rankuwa Nodes (Medunsa/TUT and CBD), Kopanong Station in Soshanguve South, Hammanskraal CBD. The objectives is to revive marginalized communities through economic development in public transport nodes, but also through provision of a range of services and opportunities to support liveability.

-In the *Central east and west of Tshwane*: spatial interventions for sustainable use of available resources will focus in (West) Atteridgeville Station, Saulsville Station linking to Atteridgeville CBD and surrounding localities for infill and densification. Large tracts of land have already been earmarked for mixed use high

density human settlements. Whilst the (East) will require infrastructure upgrade and connectivity to the Menlyn Node, in the Mamelodi area transit oriented zones in Eerste Fabrieke, Denneboom, Greenview and around the town centre require infrastructure upgrade to unlock land development, intensification of mixed uses with transport providing the strong anchor for development .

-*South of Tshwane*: Olievenhoutbosch node offers opportunity for mixed use development with varying housing densities, whilst the Centurion CBD has a regional relevance anchored by the Gautrain station and the retail and office component.

-The far east of the city envisions a mega town centre in the far east and application of the revitalization in the township areas of Refilwe, Rethabiseng, Zithobeni, Bronkhorstspuit, whilst the rural area requires investment in the agricultural sector.

Contain development within the growth management zones as identified in the RSDFs.

-This means containing growth within the demarcated urban edge area with primary focus in localities where infrastructure already exists.

Application of the Densification and Compaction Strategy around nodes and corridors towards achieving the MSDF 2012 intended outcomes. Tshwane's spatial forms remains fragmented and sprawled disadvantaging its communities. Human Settlement Development should be focused in nodes and corridors.

Whilst there remains a significant need for upgrading of informal settlements, the city should begin re-integrating its communities in attempting to achieve social cohesion and a functional urban space.

The implementation of the Tshwane Rapid Transport (TRT) network, remains a short-medium-long-term priority corridor for densification. This should encompass packaging detailed specific localities, various types of mixed land use yield, socio-economic infrastructure requirements and costing thereof. It is within these corridors that various income group housing typologies should be introduced in support of densification principles with supporting socio-economic infrastructure, livable spaces such as public parks, public arts, accessibility to pedestrian walk-ways, cycle paths etc.

B.2 Trends and Demand for Economic Infrastructure

BEPP Content Guidelines – as per BEPP Guidance Note 2016/17-2018/19

This section of the BEPP should seek to:



- Unpack the requirement for faster and more inclusive economic growth with a focus on more efficient and competitive infrastructure that promotes productive growth and results in job creation (rather than consumption only).
- Highlight impediments to development of economic infrastructure

B.2.1 Introduction

B.2.1.1 Gauteng City Region

The Gauteng Spatial Development Framework (GSDF, 2011) elevates the prominence of Tshwane as part of the Gauteng Economic Core, an administrative capital city and home to the public sector is highlighted. The importance of the concentration of economic opportunities in the southern and eastern parts of Tshwane (now forming part of regions 5, 6 and 7) is also highlighted. The following five critical factors were identified in the GSDF and their spatial implications are included in the MSDF 2012:

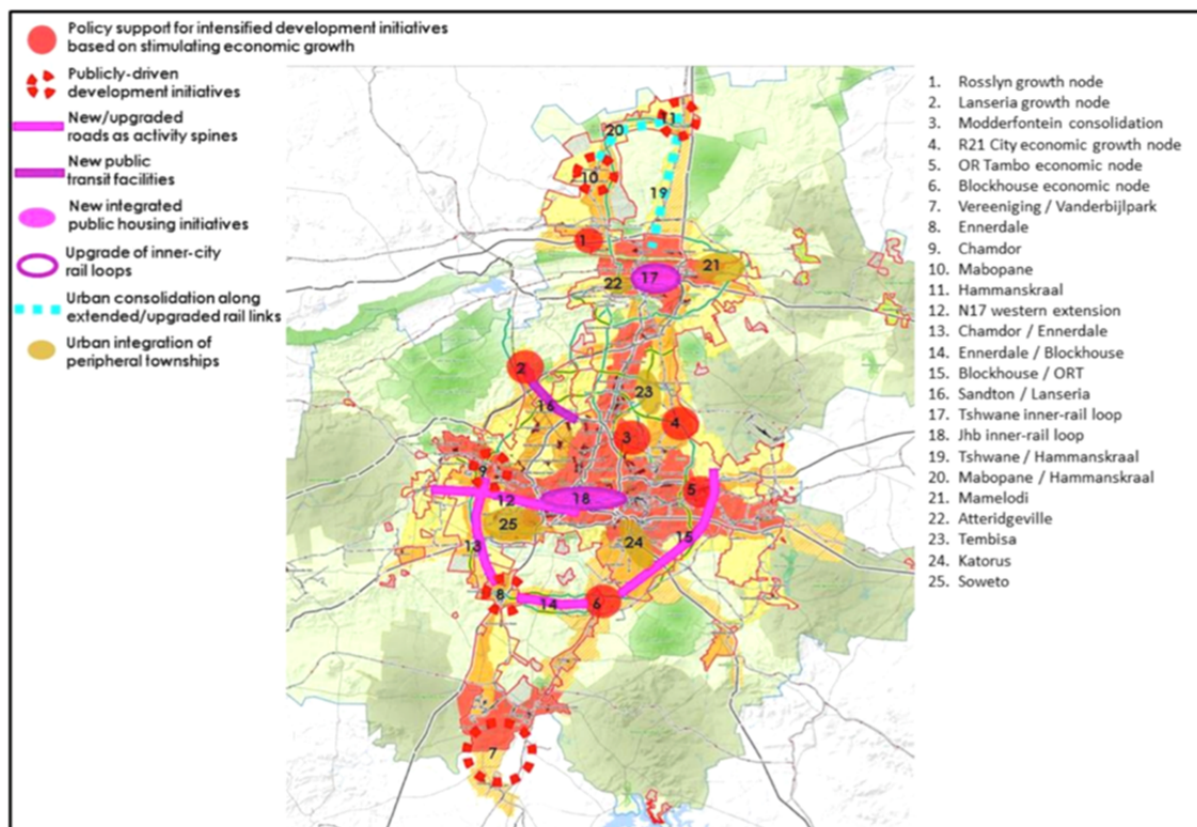
- Contained urban growth;
- Resource based economic development (resulting in the identification of the economic core);
- Re-direction of urban growth (stabilise/limit growth in economically non-viable areas, achieve growth on the land within the economic growth sphere);
- Protection of rural areas and enhancement of tourism and agricultural related activities; and
- Increased access and mobility.

The defined objective is to promote Gauteng as a Global City Region (GCR) i.e. “to build Gauteng into an integrated and globally competitive region where activities of different parts of the Province complement each other in consolidating Gauteng as an economic hub of Africa and internally recognized global city region”. The concept of global city regions can be traced back to the “world cities” idea by Hall (1966). The idea seeks to promote Gauteng’s development agenda by positioning the province as a globally competitive city region. The key objective is to reduce unemployment and poverty through promoting economic growth, integrated strategies and joint planning between the

different spheres of government. The nodes of regional importance as contained in the Gauteng City Region Spatial Development Framework, as well as the regional transportation links are shown in Figure B-34 and Figure B-35 respectively. In terms of the spatial plan for Gauteng, the following are of specific importance for Tshwane:

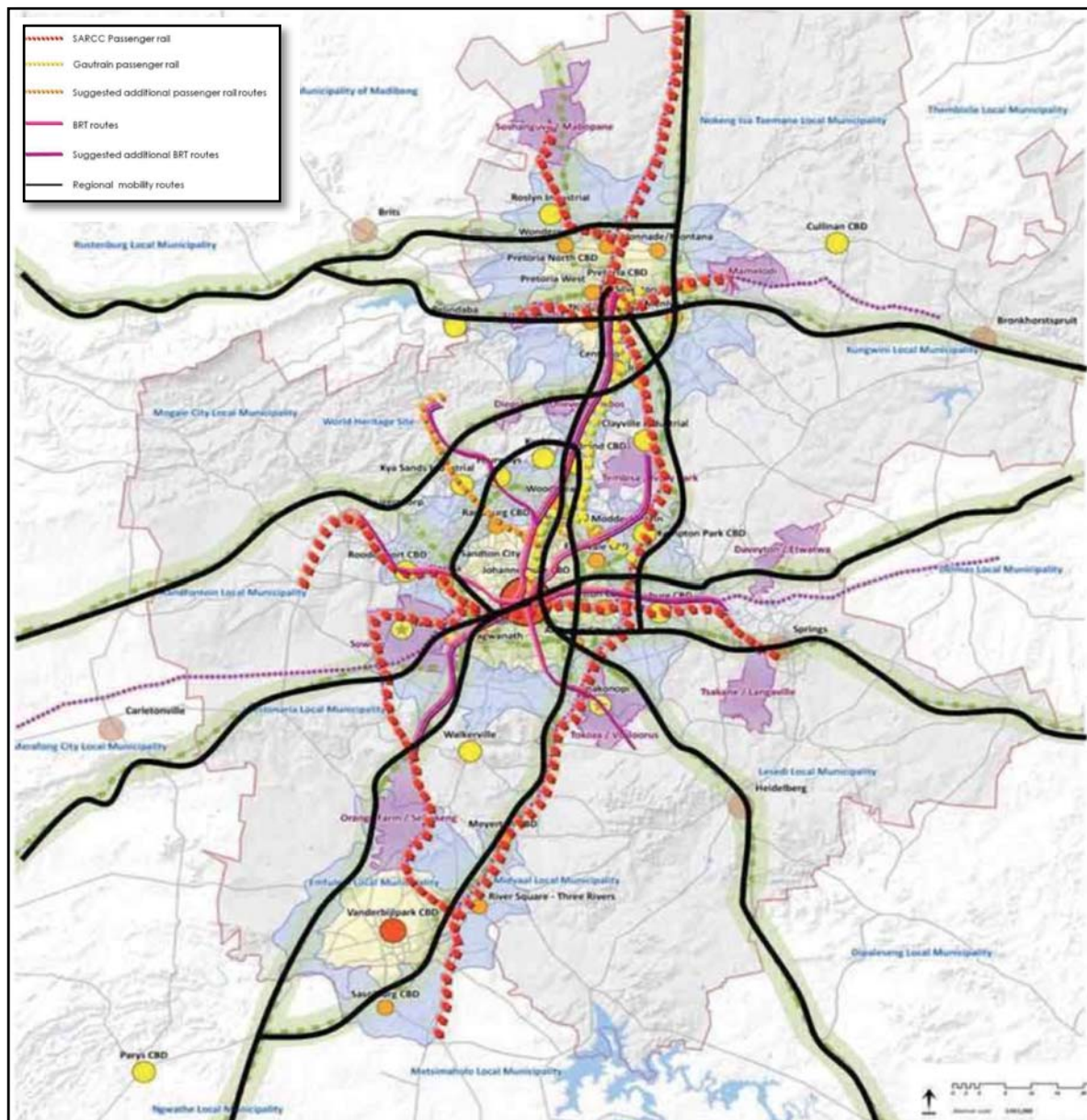
- Gauteng economic core, focussed along the R21 and N1 with Rosslyn as its northern anchor (and the Johannesburg CBD and OR Tambo International Airport in Ekurhuleni as the other anchors of the Economic Core).
- The support of corridor development along the N1, and R21.
- The importance of the R21, N1, Proposed PWV9, N4 (towards Bronkhorstspuit) and Proposed PWV2 as mobility spines.
- Rosslyn, Mamelodi, Atteridgeville, Hammanskraal and Mabopane are highlighted as important economic development nodes with the Tshwane metropolitan area.

Figure B-34: Gauteng City Region Strategic Initiatives



Source: Gauteng Integrated Transport Master Plan (2025)

Figure B-35: Gauteng City Region Activity Nodes and Regional Transport Network



Source: Gauteng Integrated Transport Master Plan (2025)

B.2.1.2 City of Tshwane Strategic Investment Areas

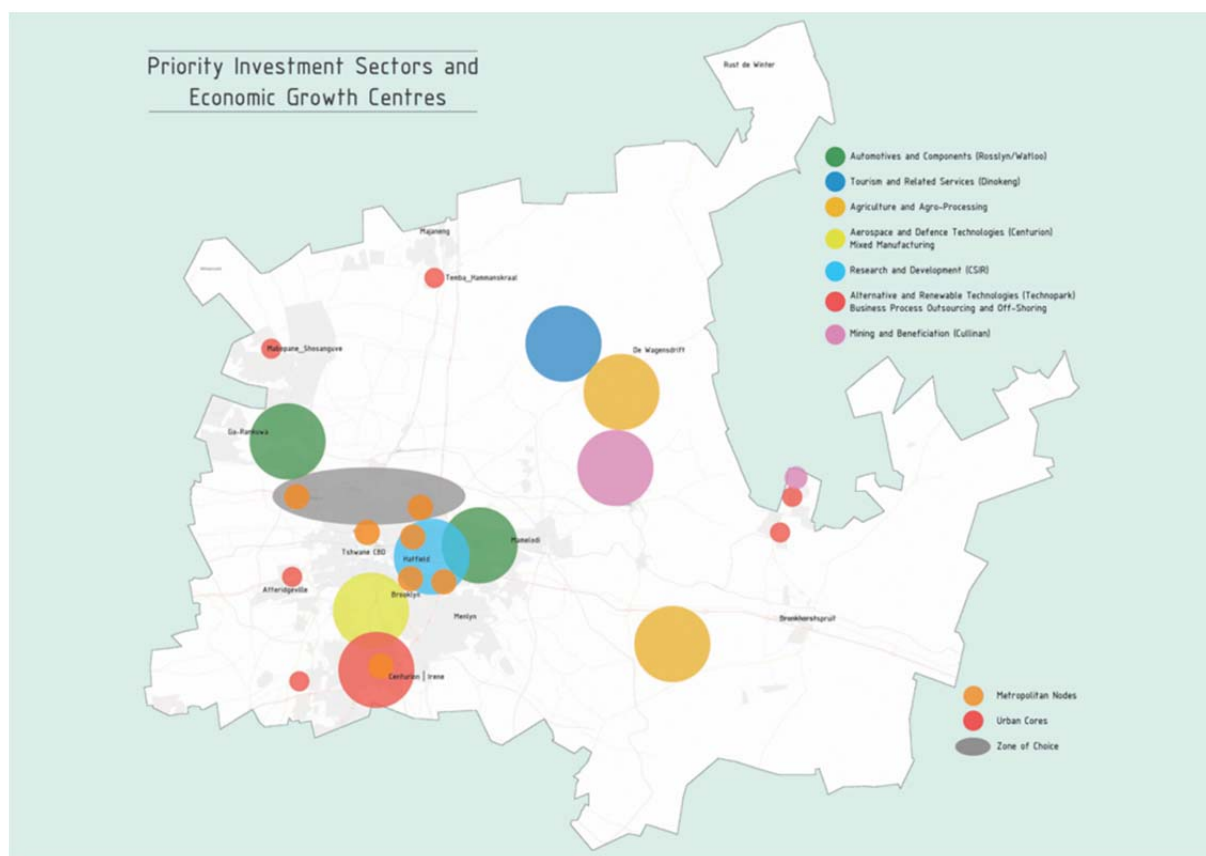
In March of 2011, the CoT approved the Tshwane Strategic Investment Attraction, Facilitation and Aftercare Plan (2011-2016). The purpose of the plan is to outline the City of Tshwane's strategic and systematic approach to the investment promotion, attraction, facilitation and retention function with the view to increase investment volumes in the City which would have a direct impact on economic growth and developments, as well as increase the employment creation potential of the economy.

The plan identifies the following as priority investment sectors for Tshwane:

- Automotive industry and Components
- Tourism and Related services
- Agriculture and Agro-processing
- Aerospace and Defence technologies
- Mixed Manufacturing
- Research and Development
- Alternative and Renewable Technologies
- Business Process Outsourcing and Off-shoring
- Mining and Beneficiation

The proposed priority investment sectors and economic growth centres are shown in Figure B-36 below. The proposed growth nodes are discussed in more detail in C.2.1 of the report. An overview of the economic infrastructure demands and trends are provided in the following sections of the report.

Figure B-36: Priority Investment Sectors and Economic Growth Centres



The following sub-section will cover the current trends and demand for economic infrastructure in Tshwane.

B.2.2 Transport Infrastructure

B.2.2.1 Transport Perspective On Economic Growth

A fundamental prerequisite for economic growth is the expansion of trade. However, it is the transport linkages that enable the exploitation and development of natural and human resources. Therefore, a region that has an inefficient and ineffective transport sector, would find it extremely difficult, if not impossible, to trade competitively.

A region that is well equipped to receive, sort and rapidly deliver goods and services cost effectively will profit considerably from these abilities. Logistic inefficiencies severely retard competitiveness and as a result encourage the transfer of economic activity to more favourable locations. The same applies to the ability of a city to transport its workers efficiently, both in terms of time and cost. The development of efficient freight and transport infrastructure is therefore critical to the economic success of Tshwane.

B.2.2.2 Freight and Logistics

Transportation of freight is a vital element in planning for prosperity. The overarching objectives of all freight transport are by definition, the economic efficiency of the movement of goods so that freight transport policy and investment is primarily directed at creating conditions that support that objective. According to the State of Logistics 62% (50% transport and 12% Fuel inflation) of the total logistic cost is transport related. The biggest contributors to transport cost are fuel, maintenance and wages. Dwell time as a result of congestion on roads, standing time at warehouses and slow movement in the CBD are not directly measured but is reflected in fuel price, investment cost, and wages.

One of its biggest challenges in South Africa will be to provide sufficient road and rail capacity in the next 25 years. Considering, the fact that the capacity expansion programmes at the port of Durban mainly makes provision for container terminals and an automotive terminal, which directly affect Tshwane. The capacity of twenty-foot equivalent containers (TEUs) will increase from 3 million per annum to 13.9 million per annum. It is planned that more than 5 million of these TEUs will move to Gauteng with a margin to Tshwane. Intermodal modal freight is therefore one of the fastest growing commodities in South Africa which would require mega terminals on the periphery of Gauteng in the future.

B.2.2.2.1 Freight landscape in Tshwane

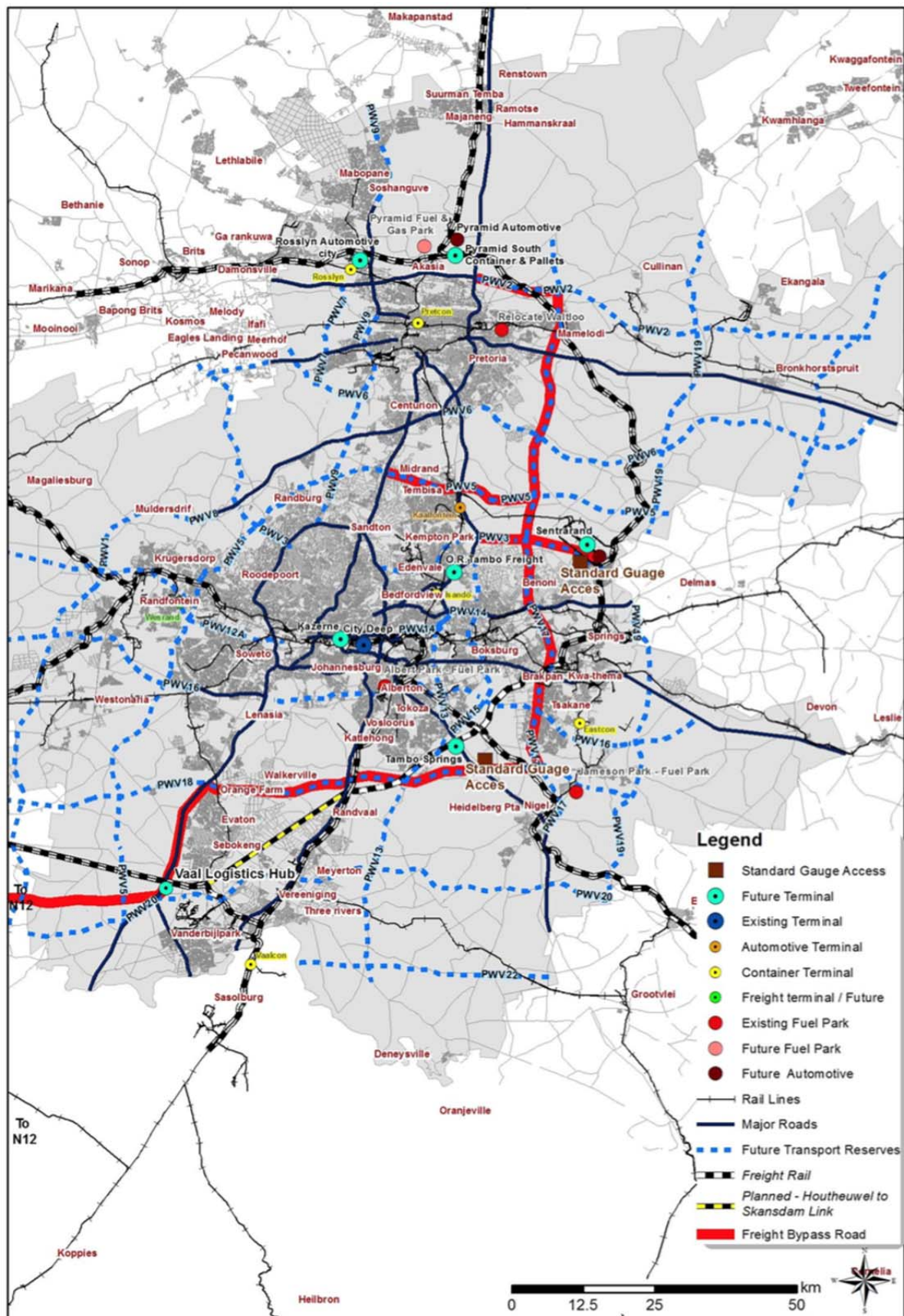
The existing and proposed future freight terminals in Gauteng are shown in Figure B-35. The current freight terminals in the Tshwane area are:

- Pretcon in the Capital Park area;
- Roscon in Rosslyn; and
- Waltloo as a major fuel terminal.

These terminal support the following industries:

- Heavy industrial areas (Mittal, PPC and Transnet workshops at Koedoespoort and Capital Park)
- Light industrial areas (small scale manufacturing and warehousing in the Rosslyn Area, Pretoria West, Waltloo and Silverton as well Centurion);
- Fuel distribution from Waltloo);
- Automotive manufactures in Rosslyn as well as in Waltloo;
- Distribution centres, SAB, ABI Coke Cola and the fresh produce market in Rosslyn and Pretoria West, as well as amongst others Woolworth and Shoprite in Centurion.

Figure B-37: Gauteng freight terminals and proposed supporting road network



Source: Gauteng Integrated Transport Master Plan (2025)

B.2.2.2.2 Characteristics of the current freight terminals

The current operational characteristics of the Pretcon, Rosslyn and Waltloo freight terminals are summarised in Table B.2.2-1.

Table B.2.2-1: Terminal operational characteristics

Pretcon the exiting container terminal in Tshwane CBD	
Stacking area	1 194 TEUs
Number of Rail Tracks	2 x 50 wagon track
Throughput in 2011	210 container movements
Number of trains per day	1 train per day
Operating hours	Daylight
Road access	Paul Kruger road
Constraints	<ul style="list-style-type: none"> • Rail access to the site through metro lines. • Terminal operates at capacity. • Restricted road access. • Site next to residential area. • Limited expansion capability. • Operations during peak hours. • Queuing of trucks at terminal affect traffic in the area. • Aged handling equipment.
Rosslyn Terminal in Rosslyn and close to the Rosslyn station	
<ul style="list-style-type: none"> • Rosslyn include the automotive area which services BMW and Nissan; • Private container terminals located close to manufactures. The cargo in these containers is directly related to the industry and includes vehicle parts, manufacturing components, chemicals and upholstery; • Utilize road transport extensively; • Rail access to the motor manufacturers and terminals through the metro network; • No direct access to the 25 kV freight line; • Limited rail capacity for export vehicles; • Roscon has no container activities: <ul style="list-style-type: none"> ○ Loading chrome at the site. ○ Road access to the site is limit. ○ Rail access to the site through metro lines. ○ No capacity expansion capabilities. 	
Waltloo Fuel Terminal	
<ul style="list-style-type: none"> • The private operators own the facility: BP, SASOL and Total. • Transnet supply fuel through the fuel pipeline from Durban, to the facility. • The facility supply fuel to Tshwane CBD and neighbouring regions, which include Mpumalanga, Polokwane and North West. • The fuel tank facility is located in an environmental sensitive area close to other industries. • Tanks are not filled to capacity due to safety risk. • Some of the tanks will reach the end of their life cycle in the next to 10 to 15 years. • Distribution fuel domestically and to the industry becomes a challenge during peak hour operation. 	

B.2.2.2.3 Pyramid Freight Terminal

The development of the Pyramid Logistics Hub has been identified to support the automotive and related business in the Rosslyn and Zone of Choice. The purpose of the proposed terminal at Pyramid will be to:

- Consolidate freight; ☐
- Establish an intermodal facility for road and rail transport; ☐
- Establish truck stop facilities; ☐
- Establish warehousing to stuff and de-stuff containers; ☐
- Provide value added services such as weigh bridges, fatigue managements facilities, ☐ maintenance facilities, medical facilities, etc.; ☐
- Establish connectivity to the terminal; ☐
- Establish appropriate public transport.

The facilities to be provided at the proposed Pyramid freight terminal, its access roads and target market are summarized in Table B.2.2-2. The location of the Pyramid freight terminal, north of the N4, west of the N1 as well as the proposed PWV2/PWV17 freight corridor is shown in Figure B-35.

Table B.2.2-2: Pyramid Freight Terminal Facility Requirement¹

Proposed Terminal facilities	Existing access roads	Supporting road infrastructure required
<ul style="list-style-type: none">• 1 x Container rail terminal• 1 x Palletized rail terminal• An Automotive terminal for import and export with parking bays• Rail terminal & equipment• Stacking capacity• Warehousing• Truck stop/truck staging facility• Fuel tank facility• Distribution centre	N1, R101, N4 east, N4 west	PWV 2, PWV 17, PWV 9, K6, K9, K63 upgrade, interchanges
	Market	
	<ul style="list-style-type: none">• Pretoria and Northern region• North West province• Limpopo• Mpumalang	

¹ Gauteng 25-Year Integrated Transport Master Plan Annexure I: Freight Plan

The Pyramid Freight terminal will have good access to the rail and road network and will alleviate many of the constraints currently experienced in Rosslyn as well as Waltloo for both containerized freight and fuel distribution.

B.2.2.2.4 Rail Network

The rail freight network located on the outer ring of Tshwane running through the Pyramid yard. The Pyramid terminal is one of the main freight hubs in the rail network linking the 25 kV rail network from Thabazimbi and Polokwane to the 3 kV network to Tshwane CBD, Mpumalanga and Sentrarand. The proposed Pyramid terminal will be able to accommodate 100 wagon trains destined for the export market.

Currently, rail access to the Rosslyn industrial area is through the PRASA/metro area. Ideally all rail freight should be moved to the freight network. A link could be provided from the freight network into the Rosslyn area. Table B.2.2-3 summarises the types of freight and its origins and destinations.

Table B.2.2-3: Freight on the rail and road network

ORIGIN/ DESTINATION	TYPE OF FREIGHT
Rail based products <ul style="list-style-type: none"> Lephalale, Thabazimbi, Rustenburg, Marikana, Bleskop 	<ul style="list-style-type: none"> Export market: coal, chrome, ferro-chrome, granite. Local market: cement, iron ore, vermiculite, coal. Imports to area: fuel, coking coal, containers, magnetite, manganese and alloys.
Tshwane	By Rail <ul style="list-style-type: none"> Clinker for PPC. Containers. Cement. Fuel and chemicals. Heavy engineering products.
	By Road <ul style="list-style-type: none"> Containers Food and processed foods Beverages. Building materials. Textile and footwear. Coal. High valued goods. Vehicles. Spares and equipment. Engineering materials. Livestock. Agricultural products. Fuel and chemicals.

Currently, rail access to the Rosslyn industrial area is through the PRASA/metro line. Ideally all rail freight should be moved to the freight network. A link could be provided from the freight network into the Rosslyn area.

Transnet and the Government have identified Strategic Infrastructure Projects (SIP) which will have a direct impact on the development of the area. The SIP projects which will have a direct impact Tshwane are listed below: □

- Pyramid intermodal terminal and the relocation of Pretcon to this new facility;
- Possible automotive facility at Pyramid to consolidate long trains for the import and export of cars;
- Freight link into Rosslyn;
- Automotive city at Rosslyn; and
- Freight ring rail linking Pyramid to Durban via Sentrarand.

B.2.2.2.5 Overview of constraints relating to freight facilities in Tshwane

The following table provides an overview of the constraints relating transport and movement of freight in the Tshwane.

Table B.2.2-4: Overview of freight movement constraints in Tshwane

CONSTRAINTS IN RESPECT OF FREIGHT FACILITIES IN THE CITY OF TSHWANE
<ul style="list-style-type: none"> • Limited capacity to expand; • Located in the CBD and in or close to residential areas; • Limited road access; • Limited rail access; • Distribution through the CBD during peak hours; • In most instances the facilities are old and will reach the end of its life cycle within the next few years. <p>The following key principles and departure points are considering in developing the freight strategy for Tshwane, namely:</p> <ul style="list-style-type: none"> • Identify freight growth nodes; • Decrease the number of heavy freight vehicles in the CBD; • Align with Gauteng integrated transport strategies; • Establish an Light Industrial Hub in the Pyramid precinct to unlock economic growth in Tshwane and to lower logistic costs of freight; • Align freight intermodal facilities with Transnet's Container Strategy for Gauteng and Durban port developments; • Provide supporting infrastructure to freight intermodal facilities; • Provide adequate overload control mechanisms at freight intermodal facilities; • Provide adequate public transport to the planned freight intermodal facilities and associated developments around it; • Provide adequate levels of safety and security.

B.2.2.2.6 Strategic freight and logistics projects

The City of Tshwane's draft CIP proposes that a number of projects need to be implemented in the short, medium and long term to unpack and improve the management of freight in Tshwane. These projects are summarised in Table B.2.2-5 below.

Table B.2.2-5: Strategic freight and logistics projects

Projects	Before 2020	2020 to 2030
Establish Abnormal routes	<ul style="list-style-type: none"> • Provide adequate signage ☐ • Improve law enforcement ☐ • Establish abnormal routes with SANRAL ☐ • Publish limitations of existing routes on permits ☐ • Issuing of permits by Tshwane electronically and/or through a web-system ☐ • Align with SALGA strategy and initiatives ☐ • Develop truck stop and overnight facilities ☐ • Develop an intelligent transport systems (ITS) or integrate with planned ITS systems ☐ 	
Establish Technical workgroup for Hazardous goods	<ul style="list-style-type: none"> • Establish technical working group ☐ • Provide adequate signage ☐ • Improve law enforcement ☐ • Develop demarcated areas for hazardous goods at existing truck stop or parking facilities ☐ • EIA process ☐ 	
Establish Pyramid development zone	<ul style="list-style-type: none"> • Intermodal facilities ☐ • Automotive facilities ☐ • Truck stop facilities ☐ • Warehousing ☐ • Gas facility supplying gas to surrounding developments and Tshwane ☐ 	<ul style="list-style-type: none"> • Relocation of Fuel tank farm at Waltloo to Pyramid ☐ • Develop a gas electricity power facility to supply green electricity to Tshwane ☐
Establish a Freight Transport Working Group	<ul style="list-style-type: none"> • Establish freight transport working group and/or department 	
Develop a Freight Transport Master Plan	<ul style="list-style-type: none"> • Appoint Technical team to develop a freight transport master plan and/or management plan 	
Establish weighbridges	<ul style="list-style-type: none"> • Identify sites ☐ • Develop and build facility on N14 and N4 west ☐ • Provide adequate signage to guide heavy vehicles ☐ • Improve law enforcement ☐ • Develop an information system to manage, control and store data. ☐ 	<ul style="list-style-type: none"> • Build a facility at R21 ☐ • Develop information systems ☐ •

Projects	Before 2020	2020 to 2030
Establish truck stops/ fatigue management centres at the weighbridges	<ul style="list-style-type: none"> Identify and develop truck stop facilities with supporting infrastructure for value added service: ☐ Fatigue managements systems ☐ Medical facilities ☐ Fuel and maintenance facilities ☐ Overnight facilities ☐ 	

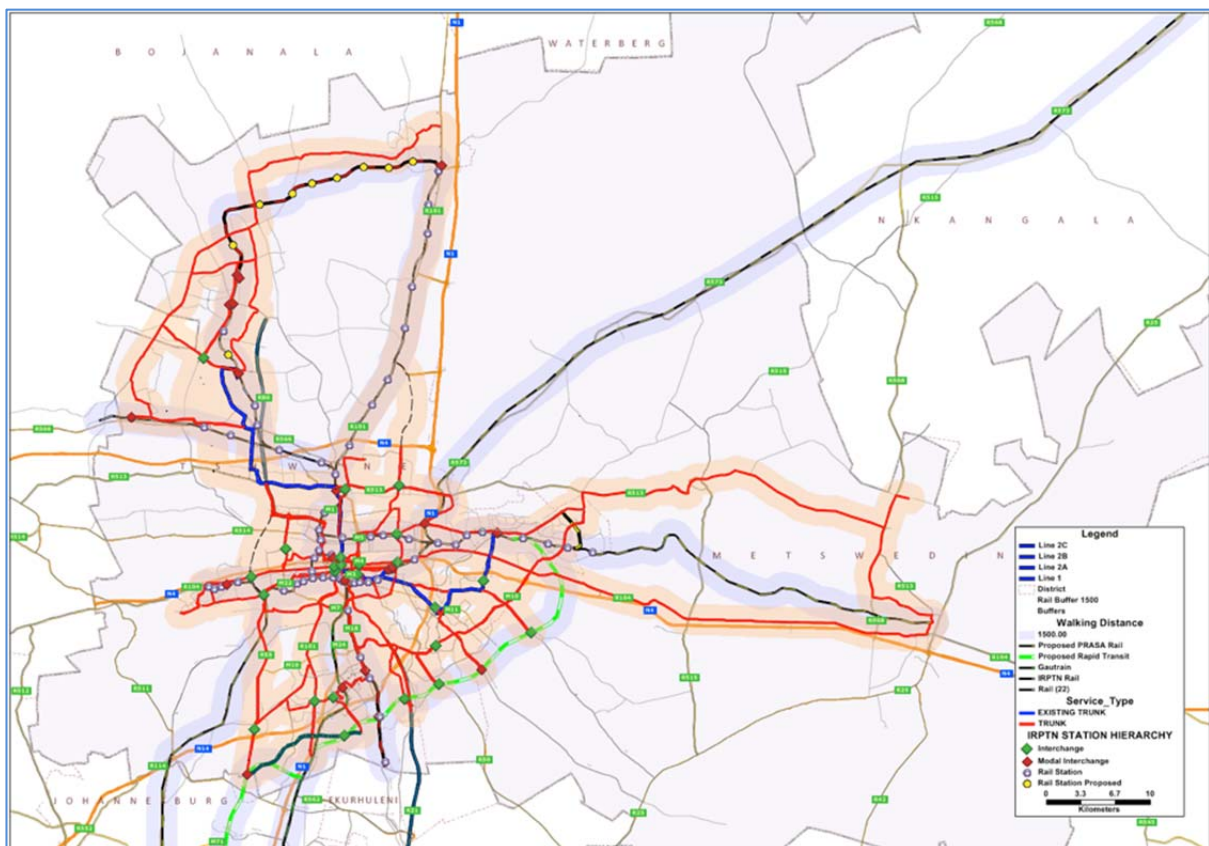
B.2.2.3 Public transport infrastructure

The City of Tshwane is currently investing in the improvement of the public transport services provided within the city. The implementation of safe, reliable, efficient and affordable public transport increases the citizens financial and social wealth, which ultimately contributes to the growth of the City.

B.2.2.3.1 Integrated Rapid Public Transport Network (IRPTN)

The City completed its IRPTN operational plan for the period for the period 2014 – 2037 (25 years) in February 2015. The purpose of the Operational Plan is to provide the CoT with a strategy pertaining to the proposed future implementation of the rapid transit component of the City's integrated public transport network. The proposed IRPT network is shown in Figure B-38.

Figure B-38: IRPT Network Coverage



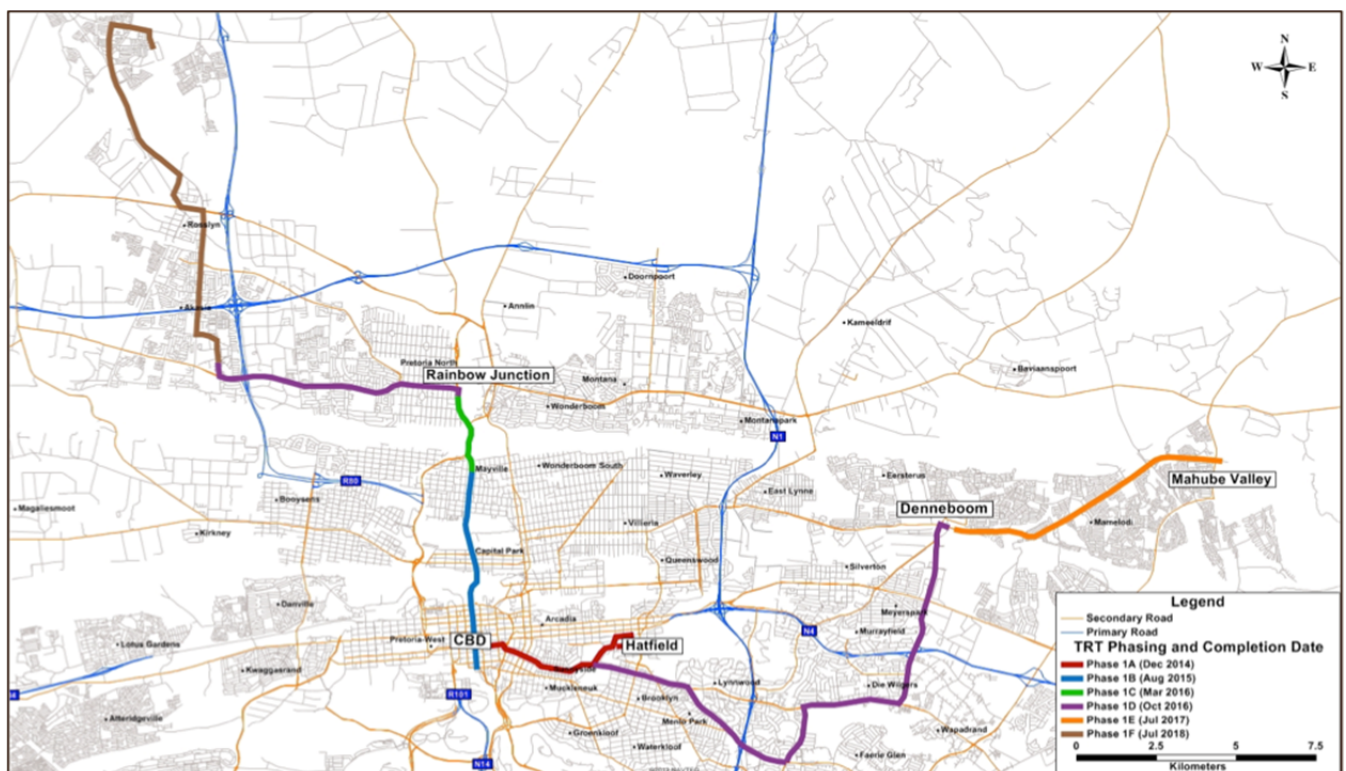
The IRPTN covers the established areas of Pretoria and Centurion, but also proposed rapid public transport links to Atteridgeville, Mamelodi, Mapobane and Shoshanguve. In addition, linkages to Bronkhorstspuit, Rayton and Cullinan are also proposed.

B.2.2.3.2 IRPTN implementation – Tshwane Rapid Transit

The City launched phase 1A of the Tshwane Rapid Transit (TRT) in December 2014. This bus rapid transit system links the Pretoria CBD with Hatfield. Buses run at a high frequency for extended periods of time. This service links various education and research institutions (University of Pretoria, UNISA, TUT, SABS, various schools), hospitals, embassies and government departments. The service is unique in that it provides free Wi-Fi to commuters on all stations and all buses.

The future phases of the TRT (Refer to Figure B-39) will link Shoshanguve and Mamelodi with the CBD and will reduce travel and cost for commuters in these areas.

Figure B-39: TRT Lines 1 and 2 Implementation Programme



B.2.2.3.3 Introduction of Light Rail as a mode

The City finalised a pre-feasibility study in 2015 into the introduction as light rail as a transport mode on selected corridors of the IRPTN. Light rail has been proven as a transport mode, which transforms the urban landscape of a City. The introduction of rail based transport modes implies a permanence of infrastructure and public transport, which is not necessarily perceived to be the case when buses are used as a primary mode of transport. The light rail pre-feasibility study indicated that the introduction of light rail can be an economic viable alternative on specific corridors in the

City. The City is currently evaluating the recommendations of the study and a decision on the way forward with the implementation of light rail as a mode of transport.

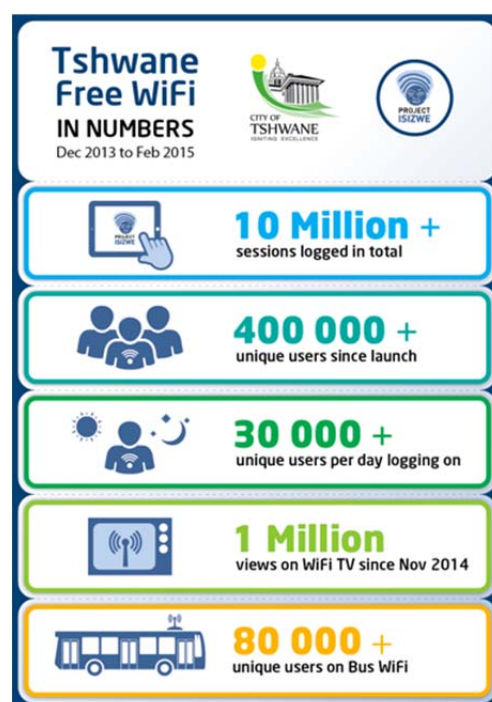
B.2.2.3.4 Implementation of Automated Fare Collection

An Automated Fare Collection System which is fully compliant with the Department of Transport's regulations for Integrated Fare Collection Systems is currently being rolled out on TRT as well as Tshwane Bus Services (TBS). This system will be fully operational in 2015 and will provide commuters with a single ticket and integrated fares on the TRT and TBS services within Tshwane.

B.2.3 Communications technology – Tshwane Free Wi-Fi

An Internet Economic Impact Study conducted by World Wide Worx² has revealed that the Internet economy contributes 2 per cent to South Africa's gross domestic product (GDP). Moreover, this contribution is rising by around 0.1 per cent a year, meaning it should reach 2.5 per cent by 2016. The full impact of these websites on the economy is placed in perspective by the number of SMEs that would not have survived without a website. Approximately 150,000 SMEs in South Africa would not be able to survive without their Web presence. With SMEs accounting for about 7.8-million jobs in South Africa, this means as many as 1.56-million jobs would be in jeopardy were it not for the Internet. It is expected that over time the internet economy will begin approaching the size of the construction sector (an estimated R120-billion in 2011), suggesting this is potentially one of the new building blocks of the South African economy.

The City of Tshwane has successfully rolled out the first phase of its free Wi-Fi project to residents and students in Tshwane at open public spaces in line with its long-term plan to provide free Wi-Fi to all government educational institutions in Tshwane by 2016, and to embrace digital technologies for the purposes of education and economic upliftment.



² Goldstuck, A. 2012. Internet Matters: The Quiet Engine of the South African Economy. World Wide Works, Pinegowrie.

Over 400 000 unique users have accessed the Tshwane free Wi-Fi network. With Phase 2 going live the City expects an exponential increase in traffic and positive impact on its communities.

The rollout of the second phase will make the City of Tshwane the largest provider of free Wi-Fi in South Africa with capacity for 1 million users in public spaces at 213 schools in Soshanguve, Mamelodi and Atteridgeville. Collaboration with Project Isizwe, a non-profit making global movement that aims to provide free internet to Africa, has ensured the successful installation of a fully managed free internet zone (FIZ) to amongst others:

- Tshwane University of Technology's Soshanguve Campus
- University of Pretoria's Hatfield Campus
- Tshwane North College
- Mamelodi Community Centre
- Church Square
- More than 200 schools.

Each FIZ location allows users with Wi-Fi enabled devices such as mobile phones, tablets, laptops and desktop computers to access free internet without any logins or passwords. The locations of the free internet hot spots are shown in Figure B-40.

Tshwane's progress towards sustainable transport

As part of its commitment to providing a safe and efficient transport service, the City of Tshwane acknowledges its role in transforming the existing system into a more sustainable form of transport. Initiatives that have already been undertaken with this responsibility in mind, or are in the process of being rolled out, and include:

SA Annual Transport Week - Following global trends, the City of Tshwane needs to encourage commuters to use public transport and reduce car use. However, in the past many areas in the City of Tshwane were neglected when public transport routes were established. These gaps need to be redressed. During the annual Transport Week the City of Tshwane focuses on creating awareness and investigating the creation of a quality public transport system, modernising transport infrastructure, and using green transport options such as park and ride facilities, car-sharing facilities, and walking/ cycling links to transport nodes.

FindMyWay - for the Earth Hour Capital Challenge, the City of Tshwane showcased a smartphone application called 'FindMyWay ZA' which was developed for the challenge by app developer

‘WhereIsMy Transport’. This app allows public transport users to locate potential public transport modes, the various routes and associated times, and generally assists users with planning their trips. The City is in the final stage of deciding on how this application can be rolled out fully, and to incorporate real time passenger rail information.

80 Compressed Natural Gas (CNG) buses – these buses are being procured for the A RE YENG Bus Rapid Transport (BRT) fleet and the Tshwane Bus Service with the target of 30% of the fleet using CNG. Research has shown that for CNG there is a significant transport cost saving as high as 30% (depends on type of vehicle). This initiative forms part of the City’s gas-to-energy project, whereby landfill gas is converted into electricity for a variety of uses. As part of this bus procurement process, aspects related to filling points (e.g. at the depot or as part of the new A RE YENG stations). There is also opportunity to introduce CNG to taxi industry, through the help of private investors, which will open up further opportunities for synergy in the transport sector. The use of CNG can be extended to other municipal vehicles (such as facility management, departmental fleet, etc.)

Green Fleet - Currently 30 Volvo B9L Euro V buses have been procured from Volvo, and are being used on the Trunk and four Feeder Routes. The buses are meeting the minimum Euro V standards and operate on diesel and provision was made for Ad Blu to be used for clearing smoke emission whereby majority of pollution molecules are actually removed from the diesel gas emission. An order has been placed with Mercedes Benz by the BOC for further 40 CNG buses that will be used on the next phase to be rolled out. These buses will be operating on gas and the gas tanks will be placed/ installed on the front end of the roof for safety reasons.

Electric corporate fleet – The City is in the process of procuring 10 Nissan LEAF electric vehicles, which will serve as the corporate fleet for the City messengers. While the City is committed to this initiative, challenges related to where charging stations should be located and if they be solar powered, must still be addressed. Use this to learn lessons re: operations and infrastructure requirements for further roll-out for other municipal vehicles.

Support the private sector – by establishing gas filling stations and electric charge points; and providing the infrastructure to stimulate the private sector to purchase electric vehicles and/or bicycles where the City provides free infrastructure as part of infrastructure service delivery at public transport stations and park-and-ride facilities in support of integrated modal use i.e. Hatfield, CBD, Menlyn, Centurion.

Sustainable Energy for Tshwane (SET) – The City of Tshwane acknowledges that the transport sector is a significant consumer of energy, and its larger contributor to declining air quality. As such, the

City has implemented the national legislation banning the use of leaded fuel, and the introduction of low-sulphur diesel – a ‘cleaner’ energy source. It has also identified the prevalence of Single Occupancy Vehicles (SOVs) and the lack of reliable, safe public transport. This has led to the rationalisation that further development of the Tshwane Bus Services (TBS) will potentially attract an increased number of passengers to its services, reducing the number of SOVs on the road network. This further highlights the need for an integrated transport system.

Planning for reducing GHGE are underway specifically the testing the implications of certain interventions using the EMME model i.e. Tshwane Western By-pass (PWV 9), and the on-going data capturing i.e. provide further details for the GHG emissions inventory in support of a cleaner more energy efficient fleet.

Tshwane’s Green Economy Strategy – The City’s Transition to a Green Economy Strategy fully supports the rationalisation of the need for sustainable transport, and further sets out aspirations, objectives and appropriate actions to achieving increased mobility and connectivity, in a manner that contributes to the overall sustainable transportation system of Tshwane.

CITP sustainable transport strategies – this CITP is an acknowledgment important role that the transport sector plays in all other aspects of the City. It therefore aims to have an integrative approach to transport planning that is formulated in such a way that it guides the City towards achieving its sustainability goals. Furthermore, the section that follows (i.e. the **Error! Reference source not found.**) aims to set a framework to guide the CITP strategies towards more sustainable objectives and links each strategy to the Sustainable Transport principles outlined earlier (i.e. access, equity, health and safety, individual responsibility, integrated planning, pollution prevention, land and resource use, and holistic cost accounting). Each of the strategies presented within this CITP have been evaluated against this framework, and therefore aim to form integrative, sustainable transport solutions that are appropriate to the context of the City of Tshwane. In essence, the CITP prioritises the Integrated Public Transport Network (IPTN), supports spatial restructuring and densification (as per the Vision 2055 spatial development concept), limits dependence on non-renewable resources, reduces the City’s carbon footprint, and rolls out the NMT network.

City of Tshwane Sustainability Unit- Currently conducting a Transport Demand Management (TDM) Study, a strategy that has been suggested is a car pooling initiative together with the Transport Department is currently being investigated. A TDM strategy is also addressed in detail in the CITP.

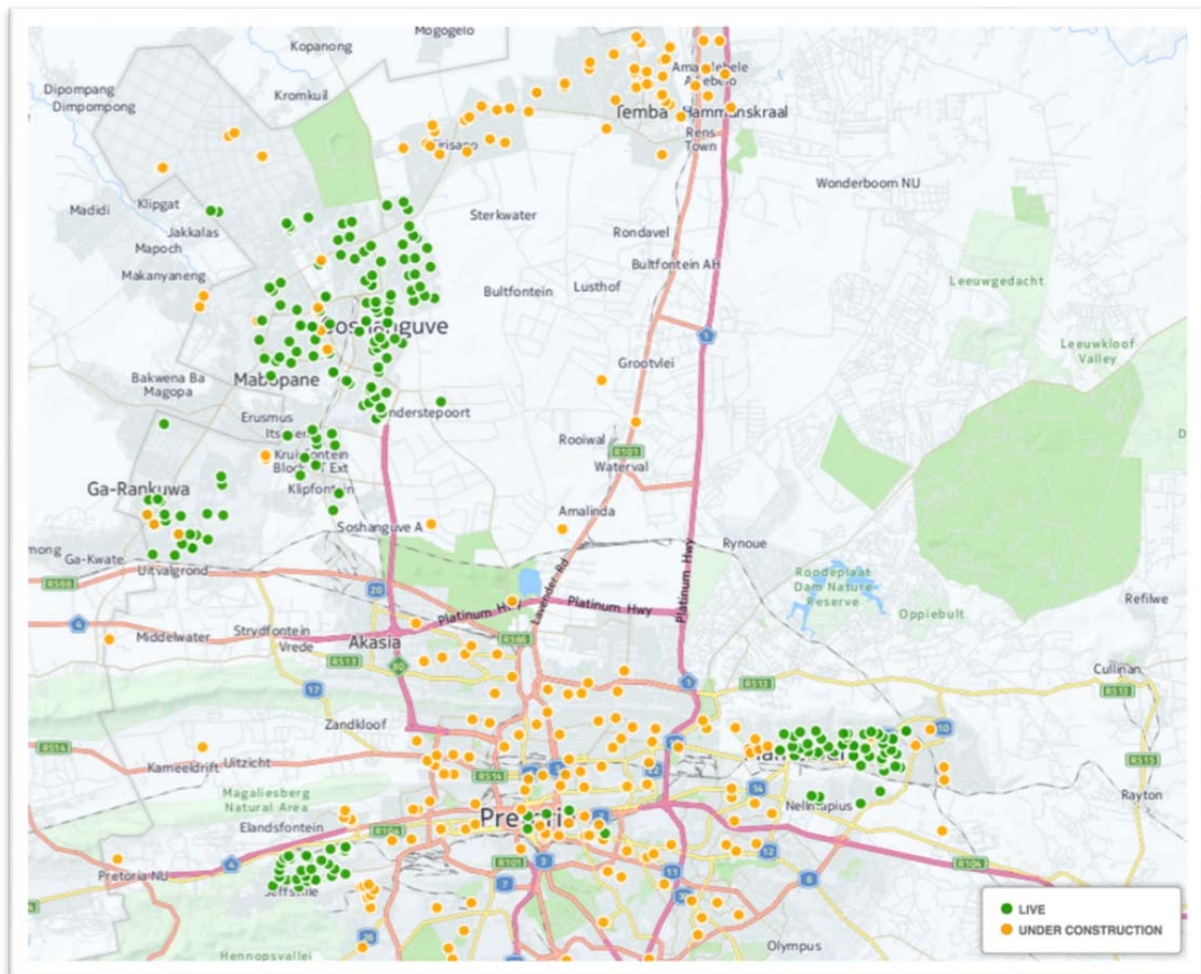
Pedestrian walkways and Cycle routes – The City has already commenced with the implementation of NMT infrastructure on K-routes such as Solomon Mahlangu Drive. Pedestrian walkways and cycle

routes have been implemented in Olievenhoutbosch, Sunnyside, Atteridgeville, Soshanguve, Mamelodi and Hatfield.

B.2.4 Electricity Generation

The City of Tshwane has two power plants, Rooiwal with a generation capacity of 450 MW and Pretoria West with a capacity of 180 MW. Both these plant are operating below their optimum capacity, due the fact that they have been designed to burn anthracite which is a high grade of coal, which is more profitable to export than to sell it locally. The City recently announced that both plants will be refurbished to improve their power generation capacity. The expected cost of these projects is R9.4 billion for Rooiwal and R300 million for Pretoria West. The upgrading of these facilities will improve the access and quality of power supply to the resident of the Tshwane and will also attract investment to the City.

Figure B-40: City of Tshwane Free Wi-Fi hotspot rollout



B.3 Trends and Demand for Basic Infrastructure

BEPP Content Guidelines – as per BEPP Guidance Note 2015/16-2017/18

The basic infrastructure review of the BEPP, as outlined in the BEPP Guidance Note 2015/16-2017/18, should address the following:

- Current capacity of major infrastructure services;
- Demand projections for each major service, including current unmet demand (backlogs) and future growth requirements, and;
- Asset condition and maintenance requirements (including demand for refurbishment or replacement of assets, by major services and location)



This BEPP report service infrastructure will be well-addressed however, maintenance and refurbishment/replacement will be given focus in the development of the 2015/2016 BEPP. As Council has recently adopted the RSDFs 2014, it is essential that an Integrated Infrastructure Master Plan is modelled for future growth demand. We envisage that the relook at Infrastructure Master Planning will be modelled on the consideration of sustainability principles advocated for in Tshwane Vision 2055 towards a Resilient and Resource Efficient City, but will further be informed by the Growth Forecasting Assignment currently being commissioned by the CSIR.

B.3.1 Roads and Transport

This section summarises the available information on roads and stormwater assets, backlogs and planned projects within the City of Tshwane (CoT). It is broken down per region where possible.

B.3.1.1 Asset Descriptions

There is currently little available information from which to draw an accurate, consolidated asset list of roads and stormwater within the CoT. The recently prepared Roads Master Plan may be able to provide some useful information towards this end.

B.3.1.2 Backlogs Estimation

Roads and storm-water backlogs for provision of basic services are estimated at approximately R13billion. Table B.3.1-1 below illustrates the breakdown per region. The information on roads and storm-water backlogs in informal settlements is still pending and so the information in this table does not include those backlogs. More detail on the backlogs, at project level, is shown in Table B.3.1-4 further in this chapter.

Table B.3.1-1: Roads and Stormwater Backlog Estimation

Area	Backlog (km)	Estimate (R5.0million per km)
Region 1	883	R 4 .4 billion
Region 2	983	R 5 billion
Region 3	74	R 370 million
Region 4	120	R 600 million
Region 5	320	R 1,6 billion
Region 6	48	R 200 million
Region 7	355	R 1,5 billion
Total	2720.0	R 13, 60 billion
These figures exclude backlogs in informal settlements		

B.3.1.3 Projects to Address Current Backlog and Future Demand

There are a number of planned projects relating to the upgrade of roads and stormwater infrastructure which cover upgrades to accommodate future growth, to better handle existing

capacities or address various backlogs. These are shown in Figure B.3.1-1 and Figure B.3.1-2 which follow the descriptions below.

Figure B.3.1-1 gives the spatial target areas for Roads and Stormwater infrastructure, addressing the following project categories:

- **Mega Projects:** These are planned provincial roads that are of strategic significance for the CoT, namely the PWV9, K54 and K99. They will likely be funded at National or Provincial level.
- **Roads for Growth:** These are roads important to support traffic and economic growth, focussing on the east and south-east of the City.
- **Minor Road Upgrading:** These are internal or collector roads in need of upgrading in various areas throughout the City.
- **Major Road Upgrading:** These are upgrading of main arterials mainly to the east of the City;
- **Stormwater drainage and Flooding:** These are projects improving stormwater drainage, upgrading canals and addressing flooding backlogs.
- The number of projects per suburb are also indicated in thematic colours, indicating high occurrence of projects in urban areas in Centurion, Atteridgeville and Hammanskraal (more than 9), followed by areas throughout the City (between 5 and 8). The large rural areas also indicate high number of projects in total, but at a lower intensity.

Figure B.3.1-1: Spatial Target Areas for Roads and Stormwater Infrastructure

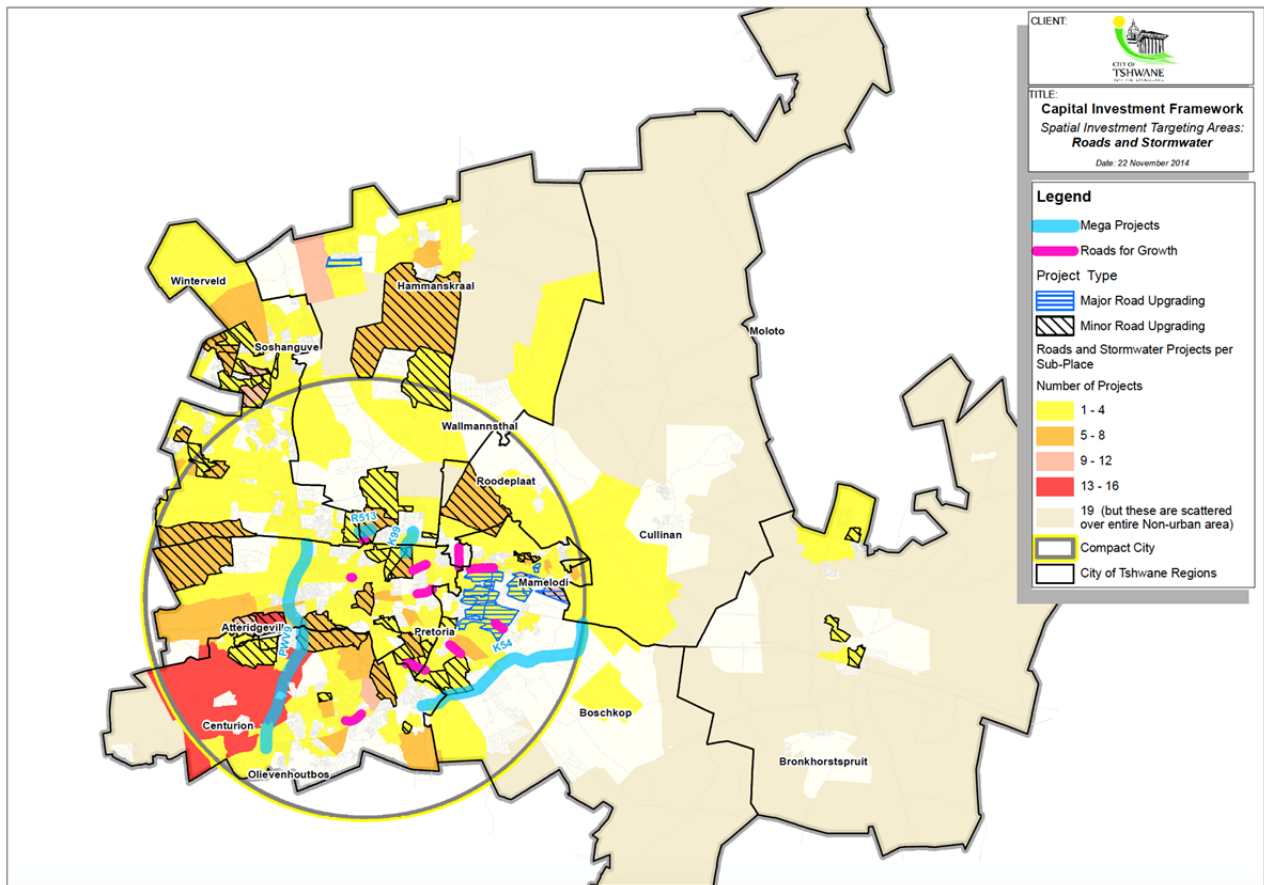
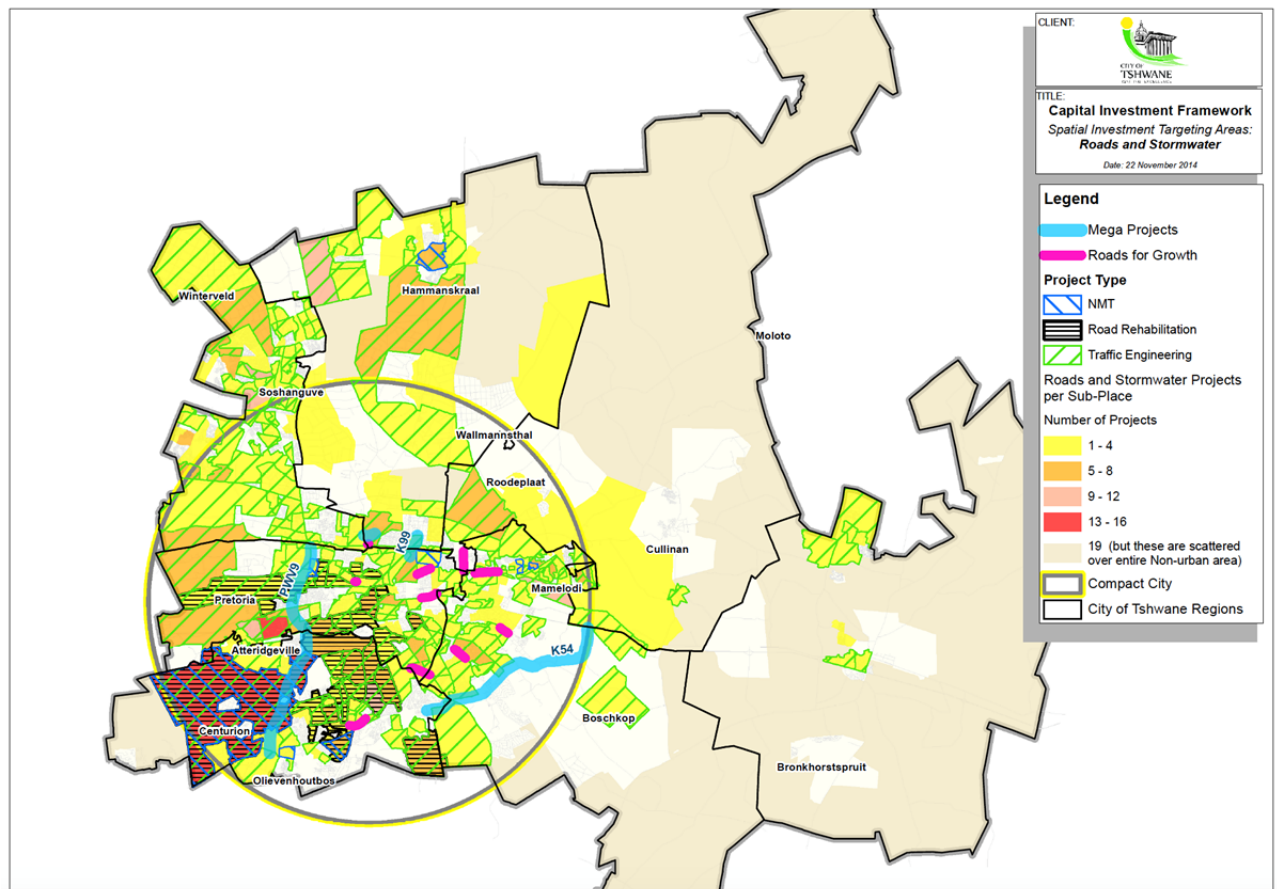


Figure B.3.1-2 below highlights further project categories for Roads and Stormwater namely Non-motorised transport (NMT), Traffic Engineering, and Road rehabilitation projects:

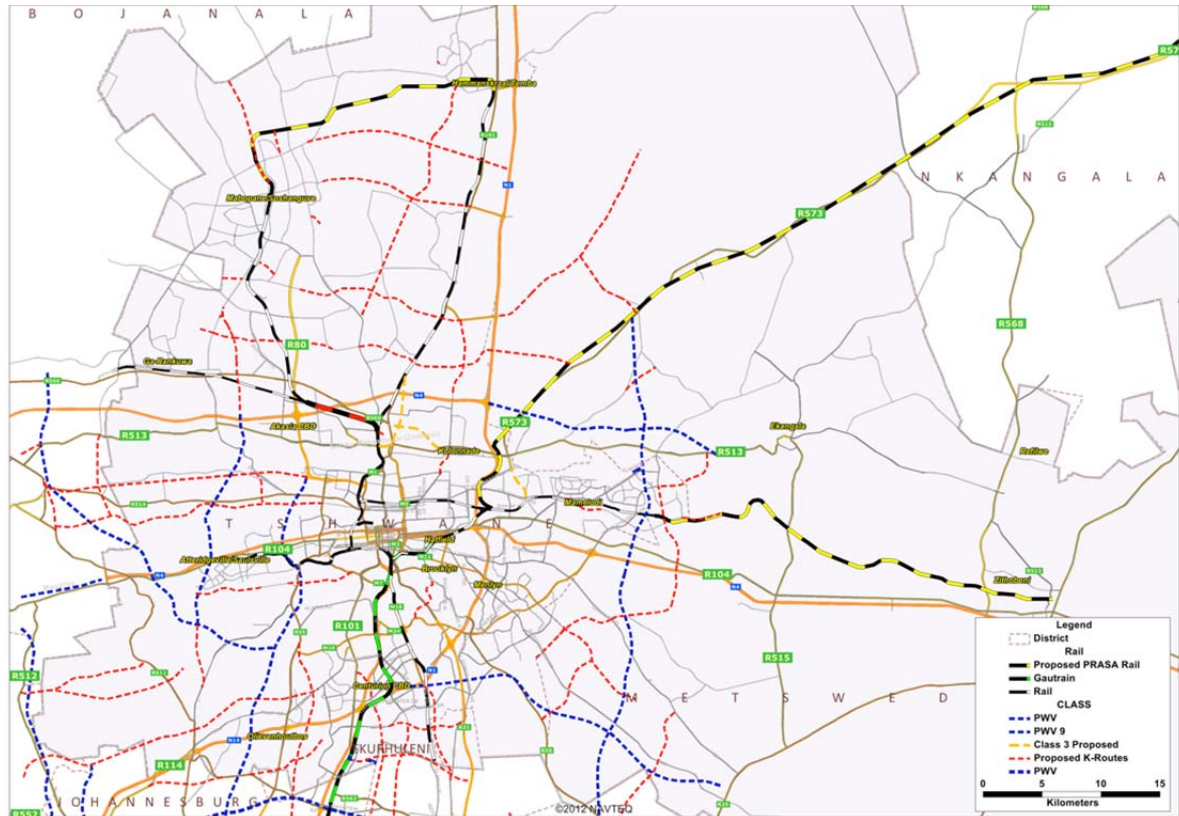
- NMT (walking and cycling facilities) in Hammanskraal and Centurion;
- Road rehabilitation projects in the central, western and southern part of the City;
- Traffic Engineering projects throughout the City, consisting of upgrading of traffic signals and intersections, upgrading of traffic signal systems, traffic calming, and some parking bays at schools.

Figure B.3.1-2: Spatial Target Areas for NMT, Road Rehabilitation and Traffic Engineering Projects



The latest available road planning for City of Tshwane (CoT) is drawn from the CoT Integrated Rapid Public Transport Plan (IRPTN) and is shown in Figure B.3.1-3. The proposed PWV 6, 7, 9 and 17 roads are indicated by the red dotted line in the figure.

Figure B.3.1-3: City of Tshwane Roads Master Plan - Classes 1 through 3



The gravel roads within Tshwane total 3036km and maintenance costs in the region of R12m; a summary of the roads and costs for maintenance are listed below in Table B.3.1-2.

Table B.3.1-2: Gravel Roads Network Extent and Costs

Region	Total Network (km)	Cost
1	823,1	R4 221 018,00
2	1152,9	R4 452 339,00
3	76,8	R273 673,00
4	124,3	R405 167,00
5	303,7	R1 022 649,00
6	240,4	R624 024,00
7	315,2	R1 078 378,00
Totals	3036,4	R12 077 248,00

B.3.1.4 Roads Projects Accommodating Growth

Table B.3.1-3 below lists the New Strategic Roads Projects and estimated associated costs as per the most recent CoT Comprehensive Integrated Transport Plan (CITP) (2015). It should be noted that some of these projects are at the planning stage and not yet approved by the Mayoral Committee.

Table B.3.1-3: New Strategic Roads Projects

Category	Project Name	Total Project Cost (ZAR)
Road Infrastructure	Lavender Road (R101) / M1 upgrade	R 96 000 000
Freight	K6 (new link) (from PWV9 to N1)	R 640 000 000
Freight	K99 Link Zambezi Drive southwards across the Magaliesberg mountain to link to the South (Dr Swanepoel Drive)	R 682 000 000
Freight	N4 to Tshwane CBD	R 88 000 000
Road Infrastructure	Pretoria Road (K22)	R 60 000 000
Road Infrastructure	Western Bypass (PWV9)	R 3 803 943 968
Freight	Western Bypass (PWV9) (from R 80 to N14)	R 3 803 943 968
Freight	K14 (from M1 to K97)	R 567 000 000
Freight	K97 Pyramid to N4 (R101)	R 280 000 000
Road Infrastructure	Derdepoort Road (K139)	R 66 702 832
Freight	Link from the PWV2 (N4) Platinum Rd to PWV17	R 2 700 000 000
Freight	PWV17 (from K54 to K16)	R 2 600 000 000
Road Infrastructure	K99 (Dr Swanepoel Rd)	R 682 000 000
Road Infrastructure	K54	R 3 375 000 000
Road Infrastructure	Solomon Mahlangu Drive	R 44 220 000
Road Infrastructure	Garsfontein Road	R 50 640 000
Freight	Class 3 Road West of PWV17 (from K16 to Lipizzaner)	R 780 000 000
Road Infrastructure	Nico Smith Street	R 31 003 200
Road Infrastructure	Stormvoël Road (M8)	R 40 800 000

Category	Project Name	Total Project Cost (ZAR)
Road Infrastructure	Lynnwood Road	R 56 400 000
Road Infrastructure	Lenchen Avenue	R 59 160 000
Road Infrastructure	Louis de Vaal I/C upgrade (link to Flower Street)	R 36 240 000
Road Infrastructure	Rooihuiskraal Interchange	R 51 600 000
Road Infrastructure	Park Street Bridge	R 60 000 000
TOTAL		R 20 654 653 969

From the table above it is clear that the City would require an estimated R21billion, in current terms, in order to implement new and upgraded strategic roads purely to accommodate new growth within CoT. A large proportion of this (R12m or 59%) is to accommodate freight movements whilst the remainder (R8.5m or 41%) is to accommodate general traffic.

B.3.1.5 Medium-term revenue and expenditure framework (MTREF)

The project and project values of planned MTREF projects in Table B.3.1-4 are taken from the MTREF in the most recent Tshwane CITP.

Table B.3.1-4: Planned MTREF projects

Category	Project Name	Total Project Cost
Roads & Stormwater	Contributions: Services For Township Development	R 35 300 000
Roads & Stormwater	Essential/Unforeseen Stormwater Drainage Problems	R 40 000 000
Roads & Stormwater	Apies River: Canal Upgrading, Pretoria Central	R 2 000 000
Roads & Stormwater	Concrete Canal: Sam Malema Road, Winterveldt	R 5 000 000
Roads & Stormwater	Major Stormwater System, Mamelodi X 8	R 17 000 000
Roads & Stormwater	Major Stormwater Systems: Klip/Kruisfontein	R 40 000 000
Roads & Stormwater	Replacement Of Traffic Signs	R 18 000 000
Roads & Stormwater	Rehabilitation Of Bridges	R 1 300 000
Traffic Engineering	Traffic Calming And Pedestrian Safety For Tshwane	R 23 900 000
Traffic Engineering	Traffic Lights/Traffic Signal System	R 25 000 000
Roads & Stormwater	Mateteng Main Transport Route, Stinkwater	R 100 000
NMT	Shova Kalula Bicycle Project	R 20 000 000
Roads & Stormwater	Mabopane Station Modal Interchange	R 28 000 000
Roads & Stormwater	Rehabilitation Of Roads	R 40 000 000
Roads & Stormwater	Real Rover Road To Serapeng Road	R 10 000 000
Roads & Stormwater	Block W - Stormwater Drainage	R 27 500 000
Roads & Stormwater	Block W - Stormwater Drainage	R 1 000 000
Roads & Stormwater	Stormwater Drainage Mahube Valley	R 25 000 000
Roads & Stormwater	Stormwater Drainage Mahube Valley	R 5 000 000
Roads & Stormwater	Magriet Monamodi Stormwater System	R 10 000 000
Roads & Stormwater	Magriet Monamodi Stormwater System	R 5 000 000

Category	Project Name	Total Project Cost
Roads & Stormwater	Major S/ Water Drainage System: Matenteng	R 100 000
Roads & Stormwater	Hartebeest Spruit: Canal Upgrading	R 3 000 000
Roads & Stormwater	Montana Spruit: Channel Improvements	R 15 000 000
Roads & Stormwater	Major Stormwater Drainage System: Majaneng	R 30 000 000
Roads & Stormwater	Major Stormwater Drainage Channels: Ga-Rankuwa	R 35 000 000
Roads & Stormwater	Stormwater Drainage Systems In Ga-Rankuwa View	R 45 000 000
Roads & Stormwater	Olievenhoutbosch Activity Spine	R 1 000 000
Roads & Stormwater	Doubling Of Simon Vermooten	R 161 000 000
Roads & Stormwater	Internal Roads: Northern Areas	R 324 000 000
Roads & Stormwater	Internal Roads: Northern Areas	R 502 975 350
Roads & Stormwater	Internal Roads: Northern Areas	R 118 351 000
Roads & Stormwater	Centurion Lake And Kaal Spruit	R 23 000 000
Roads & Stormwater	Flooding Backlogs: Stinkwater & New Eersterust Area	R 10 000 000
Roads & Stormwater	Flooding Backlogs: Stinkwater & New Eersterust Area	R 5 000 000
Roads & Stormwater	Flooding Backlogs: Sosh & Winterveldt Area	R 241 000 000
Roads & Stormwater	Flooding Backlogs: Sosh & Winterveldt Area	R 73 349 000
Roads & Stormwater	Flooding Backlogs: Mabopane Area	R 30 000 000
Roads & Stormwater	Flooding Backlogs: Mamelodi, Eersterust & Pta Eastern Area	R 50 000 000
Roads & Stormwater	Flooding Backlogs: Mamelodi, Eersterust & Pta Eastern Area	R 19 000 000
Traffic Engineering	Traffic Flow Improvement at Intersections	R 10 000 000
Roads & Stormwater	Flooding Backlog: Network 3, Kudube Unit 11	R 5 000 000
Roads & Stormwater	Flooding Backlog: Network 3, Kudube Unit 12	R 300 000
Roads & Stormwater	Flooding backlog: Network 2F, Kudube Unit 6	R 27 000 000
Roads & Stormwater	Flooding backlog: Network 5A, Matanteng	R 10 000 000
Roads & Stormwater	Flooding backlog: Network 5A, Matanteng	R 7 000 000
Roads & Stormwater	Flooding backlog: Network 2H, Kudube Unit 7	R 15 000 000

Category	Project Name	Total Project Cost
Roads & Stormwater	Flooding backlog: Network C5, C6, C11 & C13, Atteridgeville	R 24 976 350
Roads & Stormwater	Flooding backlog: Network C5, C6, C11 & C13, Atteridgeville	R 5 000 000
Roads & Stormwater	Flooding Backlog: Network 5D, Mandela Village Unit 12	R 100 000
Roads & Stormwater	Flooding Backlogs: Soshanguve South & Akasia Area	R 48 000 000
Roads & Stormwater	Flooding Backlogs: Olievenhoutbosch & Centurion Area	R 5 500 000
Roads & Stormwater	Flooding Backlog: Network 2B, Ramotse	R 20 000 000
Roads & Stormwater	Flooding Backlog: Network 2B, Ramotse	R 20 800 000
Roads & Stormwater	Flooding backlog: Network 2D, New Eersterust x 2	R 20 000 000
Roads & Stormwater	Flooding backlog: Drainage canals along Hans Strydom Dr, Mamelodi x 4 and 5	R 7 100 000
Roads & Stormwater	Flooding backlog: Network 1A, 1C & 1F, Ramotse	R 20 000 000
Roads & Stormwater	Collector Road Backlogs: Mamelodi	R 17 500 000
Roads & Stormwater	Collector Road Backlogs: Atteridgeville	R 5 100 000
Roads & Stormwater	Flooding backlog: Network 3A, Kudube Unit 9	R 10 200 000
Roads & Stormwater	Upgrading of Maunde	R 100 000
Roads & Stormwater	Giant Stadium: Buitekant Street	R 100 000
Roads & Stormwater	CBD and surrounding areas (BRT) -(Transport Infrastructure)	R 2 318 871 000
Roads & Stormwater	Upgrading of Mabopane Roads (red soils)	R 40 000 000
Roads & Stormwater	Upgrading of Sibande Street, Mamelodi	R 5 100 000
Roads & Stormwater	Upgrading of Sibande Street, Mamelodi	R 5 100 000
Roads & Stormwater	Capital Funded from Operating	R 9 000 000
Roads & Stormwater	Upgrading of roads and stormwater systems in Refilwe	R 10 000 000
Roads & Stormwater	Upgrading of roads and stormwater systems in Rayton	R 14 000 000
Roads & Stormwater	Upgrading of roads and stormwater systems in Cullinan	R 14 000 000
Roads & Stormwater	Improvement of dirt road leading to Clover hill club, Bronkhortspruit dam	R 6 000 000
Roads & Stormwater	Upgrading of Garsfontein road	R 12 000 000

Category	Project Name	Total Project Cost
TOTAL		R4 778 722 700

The total estimated cost of the above projects comes to just under R5billion. It's important to note that these projects are either to meet existing backlogs or handle existing capacities and does not take into account new growth in the City. Of the above projects, the bulk (R3.6m or 75%) is made up of roads upgrades; within this amount is R2.3billion (or 49% of the total) towards associated transport infrastructure upgrades that will be necessary when implementing the Tshwane Rapid Transit (TRT) project in the CBD and surrounds. The remainder is made up of R1billion (or 20%) towards stormwater-related issues and R97million (or 2%) towards traffic control and signage, pedestrian and cyclist projects. The remainder is not specified and will likely be spread between roads and stormwater-related projects.

B.3.1.6 Intersection Upgrades

Intersections experiencing congestion have been investigated and the relevant upgrading or adjustments identified. They are listed, not in any priority order, in Table B.3.1-5 below. These projects fall under responsibility of the Section Traffic Engineering and Operations.

Table B.3.1-5: Intersection Upgrades

Item	Intersection		Estimated cost of upgrade (2011 Rand)
	Major Road	Minor Road	
1	Ruimte Rd (K52)	Willem Botha St	R 2,660,000
2	Nellmapius Dr (K54)	Main Rd	R 2,670,000
3	Rooihuiskraal Rd	Panorama Rd	R 7,660,000
4	Walker St	Mears St	R 2,380,000
5	Ruimte Rd (K52)	Rooihuiskraal Rd	R 2,180,000
6	M17 (K217)	Access Road to Soshanguve Block TT	R 960,000
7	Jean Ave	Rabie St	R 1,480,000
8	Old Jhb Rd (K101)	Wierda Rd (K103)	R 5,610,000
9	R80 Eastbound	DF Malan Dr	R 6,650,000
10	Codonia St	Cunningham St	R 2,400,000
11	Dr Swanepoel Rd (K99)	Amandelboom Ave	R 3,520,000
12	Stormvoel Rd	Hans Coverdale Rd (East)	R 1,860,000
13	M20 (K63)	Hebron Rd (K216)	R 1,670,000
14	Atterbury Rd (K40)	De Villebois Mareuil Dr	R 2,830,000
15	Dely Rd	Matroosberg Rd	R 1,910,000
16	Daan De Wet Nel Dr	Willem Cruywagen St	R 2,200,000
17	Motlotlegi Rd	Pilane St	R 2,420,000
18	Dykor St	Moreleta St	R 2,280,000
19	Old Warmbaths Rd (K101)	Douglas Rens Rd	R 2,640,000
20	Hornsnek Rd (M17)	Van der Hoff St (K20)	R 1,640,000
21	Rigel Ave	Eridanus St	R 2,180,000

Item	Intersection		Estimated cost of upgrade (2011 Rand)
	Major Road	Minor Road	
22	Ruimte Rd (K52)	Chris Hougaard Street	R 2,110,000
23	Buitekant Street	Monola St	R 900,000
24	Rachel de Beer St (K14)	Daan de Wet Nel Dr	R 2,410,000
25	Church St	Tlou St	R 1,060,000
26	Wierda Rd (K103)	Ashwood Drive	R 1,580,000
27	Van der Hoff St (K20)	Hendriks St	R 2,200,000
28	Petroleum St	Alwyn St	R 2,550,000
29	Petroleum St	Maggs St	R 1,620,000
30	Dely Rd	Club Ave	R 3,240,000
31	Church St	Masopha St	R 2,350,000
Total Cost			R 79,820,000

The budget required to undertake the upgrades to these intersection is roughly R80 million, in 2011 terms. It's important to note that these upgrades are purely to accommodate existing traffic and does not take into account upgrades that might be required to accommodate future growth within the City. In general, the upgrades are in the region of R2.0 million to R2.5 million per intersection, with some intersections on higher volume roads such as DF Malan Drive, R80, Rooihuiskraal Road and Old Johannesburg Road costing in excess of R5million per intersection. This could be due to generally larger-scale upgrades being required at these intersections to accommodate much larger volumes of traffic.

B.3.2 Transportation

This section provides the available information on the existing infrastructure, existing backlogs and planned projects for public transport, non-motorised transport, parking and aviation within the CoT. It is broken down per region where possible.

B.3.2.1 Public transport

B.3.2.1.1 Asset Descriptions

There is some available information on bus and mini-bus taxi facilities in the CoT, shown in Table B.3.2-1 and Table B.3.2-2 below. This information is dated June 2013. The information available

includes the name, brief description and locations of the facilities; there does not appear to be readily-available information on the age, value or condition of the facilities.

Table B.3.2-1: Existing bus facilities within CoT

Suburb	Terminus Name	Rank Type	On-street	Rank Location	Description
Atterbury	Lois St btn Frikkie de Beer & Atterbury Rd	Formal	Yes	Lois St btn Frikkie de Beer & Atterbury Rd	Drop-off/Pick-up
Atteridgeville	Kalafong Bus Terminus	Formal	No	Klipspringer St (N), opp. Kalafong Hospital	Bus Rank
Babelegi	5th Street Bus Terminus	Formal	No	Babelegi	Drop-off/Pick-up
East Lynne	East Lynne Bus Terminus	Formal	No	Malgas Street c/o Gompou St	Bus Rank
Erasmus	Erasmus Bus Terminus	Formal	No	Erasmus Bus Terminus, M17	Terminus
Faerie Glen	Faerie Glen Hypermarket, Atterbury Rd	Formal	No	Atterbury Rd c/o Selikaats Causeway (S/W)	Drop-off/Pick-up
Ga-Rankuwa	Medunsa Bus Terminus	Formal	No	Medunsa, Ga-Rankuwa	Terminus
Hammanskraal	Hammanskraal Bus Terminus	Formal	No	Next to Kopanong Shopping Centre	Bus Rank
Hatfield	Jan Shoba (Duncan) Street Bus Terminus	Formal	Yes	Jan Shoba (Duncan) St btn Duxbury Rd & South St (W&E)	Drop-off/Pick-up
Hatfield	Springbok Park Bus Terminus	Formal	Yes	Springbok Park, Pretorius St, c/o Hilda St	Terminus
Mabopane	Mabopane Bus Terminus (W)	Formal	No	At Mabopane Station (W)	Terminus
Mabopane	Mabopane Station Bus Terminus	Formal	No	Mabopane Station (W)	Terminus
Mamelodi	Admin Offices Terminus	Formal	No	Waltloo St, S/W & N/E of J Letwaba St	Bus Rank
Mamelodi	Denneboom Bus Terminus (N)	Formal	No	Tsamaya Rd (N), Denneboom Station	Bus Rank
Mamelodi	Denneboom Bus Terminus (S)	Formal	No	Tsamaya Rd (S), Denneboom Station	Bus Rank

Suburb	Terminus Name	Rank Type	On-street	Rank Location	Description
Mamelodi	Ikageng Bus Terminus	Formal	No	Mohwelere and Moretlwa Streets	Terminus
Pretoria	Belle Ombre Bus Terminus	Formal	No	Belle Ombre Station, Kgosi Mampuru (Potgieter) St Extn	Terminus
Pretoria	Pretoria Station Bus Terminus	Formal	No	Scheiding Street c/o Bosman St	Terminus
Pretoria	Frances Baard (Schoeman) St btn Jeppe & Greef	Formal	No	Frances Baard (Schoeman) St btn Jeppe & Greef	Terminus
Pretoria	Nana Sita (Skinner) St btn Sisulu (Prinsloo) & van der Byl St	Formal	Yes	Nana Sita (Skinner) St btn Sisulu (Prinsloo) & van der Byl St(N&S)	Drop-off/Pick-up
Pretoria	Nana Sita (Skinner) Street btn Bosman & Sophie de Bruyn (Schubart) St	Formal	No	Nana Sita (Skinner) St btn Bosman & Sophie de Bryun (Schubart) St	Terminus
Pretoria	Nana Sita (Skinner) Street btn Sophie de Bruyn (Schubart) St & Kgosi Mampuru St	Formal	No	Nana Sita (Skinner) Street btn Sophie de Bruyn (Schubart) St & Kgosi Mampuru St	Terminus
Rietfontein	Soutpansberg Rd c/o Hamilton St	Formal	Yes	Soutpansberg Rd c/o Hamilton St	Drop-off/Pick-up
Rosslyn	Hendrik van der Bijl Bus Terminus	Formal	Yes	H van der Bijl St btn H van Eck & F du Toit, 'Rosslyn	Drop-off/Pick-up
Rosslyn	Nissan Bus Terminus	Formal	Yes	Martinus Ras St, Rosslyn	Terminus
Rosslyn	Piet Rautenbach Bus Terminus	Formal	Yes	Piet Rautenbach St Bus Terminus, Rosslyn	Drop-off/Pick-up
Saulsville	Mitah Ngobeni Bus Terminus	Formal	No	Masopha St c/o Ramokgopa St (N/E)	Bus Rank
Soshanguve	Soshanguve Station Bus Terminus	Formal	No	Soshanguve Station, M17 Road (W)	Terminus
Soshanguve	Soshanguve Station Bus Terminus	Formal	No	Soshanguve Station (E), Buitekant St	Terminus
Valhalla	Valhalla Terminus, Fergus St	Formal	Yes	Fergus St c/o Angwick Rd	
Atteridgeville	Atteridgeville X6 Bus Terminus	Informal	Yes	Vergenoeg Street, Atteridgeville X6	Drop-off/Pick-up

Suburb	Terminus Name	Rank Type	On-street	Rank Location	Description
Atteridgeville	Brazzaville Bus Terminus	Informal	Yes	Maunde St c/o Makaza Street, Att'ville X	Drop-off/Pick-up
Atteridgeville	Die Kannetjie Bus Terminus	Informal	Yes	Extension Maunde Street	Drop-off/Pick-up
Atteridgeville	Ledwaba Bus Terminus	Informal	Yes	Extension Maunde Street	Drop-off/Pick-up
Babelegi	7th Street Bus Terminus	Informal	No	Babelegi	Drop-off/Pick-up
Centurion	Centurion Bus Terminus	Informal	No	Suid & Lenchen Avenue North (S/W)	Bus Rank
Dry Gin	Dry Gin Bus Terminus	Informal	No	Next to Dry Gin	Drop-off/Pick-up
Hammanskraal		Informal	No	N of Babelegi towards Carousel	Drop-off/Pick-up
Kanana	Kanana Bus Terminus	Informal	Yes	Kanana Village	Drop-off/Pick-up
Koedoespoort	Koedoespoort Bus Terminus	Formal	Yes	Nico Smith (Michael Brink) St c/o Bloubokkie St (N)	Drop-off/Pick-up
Majaneng	Majaneng Bus Terminus	Informal	No	In Majaneng Village	Drop-off/Pick-up
Majaneng	Majaneng Unit D Bus Terminus	Informal	Yes	Majaneng Village	Drop-off/Pick-up
Mamelodi	Balebogeng Bus Terminus	Informal	No	Tsamaya Rd (N) c/o Cross St	Bus Rank
Mamelodi	Mandela Village Bus Terminus	Informal	No	Mandela Village, Mamelodi X14	Bus Rank
Mamelodi	Soccer Field Transfer	Informal	No	Hector Pietersen Street, Mams X12?	Bus Rank
Marabastad	Marabastad Bus Terminus	Informal	Yes	Extension Maunde St & Makaza St	Drop-off/Pick-up
Matikireng Village	Matikireng Bus Terminus	Informal	Yes	Matikireng Village	Bus Rank
Pretoria	Schubart St btn Visagie & Jakob Mare	Informal	Yes	Schubart St btn Visagie & Jakob Mare	Drop-off/Pick-up
Pretoria	Sisulu (Prinsloo) Street Bus Terminus	Informal	Yes	Prinsloo St btn Blood & Proes St, Pretoria	Drop-off/Pick-up

Suburb	Terminus Name	Rank Type	On-street	Rank Location	Description
Pretoria North	Wonderboom Bus Terminus	Informal	No	Paul Kruger Street at Wonderboom Station	Bus Rank
Rosslyn	Akasiaboom Stn Bus Terminus	Informal	No	Fred Otto St c/o Phillips St, Rosslyn	Bus Rank
Soshanguve	Doctor Kwindi Bus Terminus	Informal	Yes	Soshanguve GG,JJ,HH	Drop-off/Pick-up
Soshanguve	Soshanguve BB,DD Cross Bus Term	Informal	Yes	Soshanguve BB,DD	Drop-off/Pick-up
Soshanguve	Soshanguve Transfer	Informal	Yes	Soshanguve K	Drop-off/Pick-up
Soshanguve	Soshanguve XX (Blue Gum) Bus Term	Informal	No	M17- Rd 2758, 'Soshanguve VV	Drop-off/Pick-up
Soshanguve	Soshanguve XX Bus Terminus	Informal	No	Soshanguve XX	Drop-off/Pick-up
Suurman	Suurman Bus Terminus	Informal	Yes	In Suurman Village	Drop-off/Pick-up
Temba	Roma Bus Terminus	Informal	No	Next to the Roma Churh	Drop-off/Pick-up
Temba	Temba City Bus Terminus	Informal	No	Temba City	Terminus
Temba	Temba Unit 5 Bus Terminus	Informal	Yes	Unit D in Temba	Bus Rank

There are 60 registered bus facilities within the CoT. Roughly half of these (31) are formal facilities whilst the remaining (29) are informal facilities. The formal facilities could have some kind of shelter, be paved, have complementary facilities such as benches, rubbish bins, signage and toilets, however without more detailed information it is impossible to tell. The informal facilities are likely to have no paving, shelters, etc. and may just be dustbowls located adjacent to the roadway. It is important to have detailed information on what a facility might contain as well as the general condition thereof in order to maintain an asset register and manage the maintenance or upgrading thereof.

Of the 60 facilities, 25 are listed as on-street (possibly in the form of a lay-by) whilst the remaining 35 are listed as off-street. Roughly half (29) of the facilities are drop-off and pick up only, roughly a quarter (16) are termini (located at the end of a bus route) and the remaining quarter (15) are listed as bus ranks. The bus ranks may have multiple destinations and pick –up areas.

Table B.3.2-2: Existing mini-bus taxi facilities within CoT

Suburb	Rank Name	Rank Location	Rank Type	Description	RANK_ID
Asiatic Bazaar	Asiatic A Broederstroom Rank	Second Street (E) c/o ??	Informal	Operational	TR016
Asiatic Bazaar	Bazaar St	Barber St & Seventh St (N/E)	Informal	Operational	TR023
Asiatic Bazaar	Boom St & Jerusalem St	Boom St & Jerusalem St (N/E)	Informal	Operational	TR007
Asiatic Bazaar	Fourth St & Boom St (Banana)	Fourth St & Boom St (E/S)	Informal	Operational	TR103
Asiatic Bazaar	Grand St & Fourth St	Grand St & Fourth St (S/E)	Informal	Holding area	TR021
Asiatic Bazaar	Jerusalem St & Boom St	Jerusalem St & Boom St (E/N)	Informal	Operational	TR019
Asiatic Bazaar	Marabastad-Bloed East Rank	Jerusalem St & Grand St (S/W)	Informal	Operational	TR022
Asiatic Bazaar	Mogul St & Fourth St	Mogul St & Fourth St (N/W)	Informal	Operational	TR051
Asiatic Bazaar	Mogul St & Jerusalem St	Mogul St & Jerusalem St	Informal	Holding area	TR055
Atteridgeville	Brazzaville	Maunde Street Extension	Informal	Operational	TR112
Atteridgeville	Iscor Rank	Quagga & Maunde (N/W)	Informal	Operational	TR173
Atteridgeville	Kalafong Hospital Rank	Kalafong Hospital, Klipspringer Street	Formal	Operational	TR173
Atteridgeville	Phomolong	Maunde Street Extension	Informal	Operational	KAR046
Atteridgeville	Saulsville Station	Marivate St (S/E) & Mamogale St	Semi Formal	Operational	KAR087
Bronkhorstspuit	Bronkhorstspuit A		Formal		
Bronkhorstspuit	Bronkhorstspuit B		Informal		
Bronkhorstspuit	Bronkhorstspuit C		Informal		
Brooklyn	Brooklyn Circle	Duncan St & Fehrsen St	Informal	Operational	TR037
Centurion	Mall @ Reds Rank		Informal		
Cullinan	Fourway (Cullinan) East		Informal		
Cullinan	Fourway (Cullinan) West		Informal		

Suburb	Rank Name	Rank Location	Rank Type	Description	RANK_ID
Cullinan Mine	Cullinan Mine (Chris Hani Hostel)		Formal		
Doornpoort	Doornpoort Shopping Centre	Airport Street (S)	Informal	Operational	TR083
Doringkloof	Doringkloof	Aster St & Lupin St (S/E)	Informal	Operational	TR071
Eastlynne	Eastlynne A	Stormvoel Rd & Baviaanspoort Rd (N/W)	Informal	Operational	TR075
Eastlynne	Eastlynne B (Shopping Centre)	Baviaanspoort Rd & Malgas St (W/S)	Semi Formal	Operational	TR074
Ekandustria	Ekandustria	Iridium Street	Informal		
Elardus Park	Delmas Rd & Barnard St	Delmas Rd & Barnard St (S/E)	Semi Formal	Operational	TR001
Equestria	The Grove	Corner Lynnwood and Simon Vermooten (N/E)	Formal		
Erasmia	Erasmia	Vroulikspruit Street & Willem Erasmus Street	Informal	Operational	TR039
Erasmus	Erasmus	M20 (N) Erasmus Transfer	Informal	Operational	TR099
Erasmuskloof	Castle Walk	Nossob Street & Lois Avenue	Informal	Operational	TR133
Faerie Glen	Faerie Glen	Atterbury Rd (S) opposite Pick 'n Pay Hyp	Informal	Drop-off/Pick-up point	TR117
Ga Rankuwa	Ga-Rankuwa Hospital (Main Gate)	Ga-Rankuwa Hospital at Main Gate	Semi Formal	Operational	TR094
Ga Rankuwa	Ga-Rankuwa Hospital (West Gate)	Ga-Rankuwa Hospital at West Gate	Informal	Operational	TR095
Ga Rankuwa	Ga-Rankuwa Zone 15 (OK)	Ga-Rankuwa Zone 15, O.K. Bazaars	Informal	Operational	TR096
Ga-Rankuwa Unit 16	Ga-Rankuwa Zone 16	Rankhumise Street & Kgware Road	Informal	Operational	TR093
Garsfontein	Woodlands mall rank	C/O Garsfontein & De Villebois Mareuil Drive	Informal		
Hammanskraal	Gold Star 1 (North)	Caltex Garage, Old Warmbaths Rd	Informal	Drop-off/Pick-up point	TR109

Suburb	Rank Name	Rank Location	Rank Type	Description	RANK_ID
Hammanskraal	Gold Star 2 (South)	Caltex Garage, Old Warmbaths Rd	Informal	Drop-off/Pick-up point	TR110
Hammanskraal	Hammanskraal Station (Temporary)	Hammanskraal Train Station off Ou Warmbad Rd	Semi Formal		
Hammanskraal	Kopanong Shopping Centre	Ruth First Rd (W)	Informal	Operational	TR133
Hammanskraal	Mogogelo	Hammanskraal	Informal	Operational	KAR031
Hammanskraal	Roma	Suurman Street (W) to Roma Church	Informal	Holding area	KAR074
Hatfield	Tukkies (UP) Taxi Rank	Lynnwood Rd & Roper St (S/W)	Informal	Drop-off/Pick-up point	KAR149
Hatfield	University Rd Taxi Rank	University Rd (W) 200m N of Lynnwood Rd	Informal	Drop-off/Pick-up point	KAR153
Hoekfontein	Hoekfontein	Hoekfontein	Informal	Holding area	TR170
Irene	Irene Station	Botha Avenue (E) (opp. Irene Railway Stn)	Semi Formal	Operational	TR172
Kanana	Kanana	Hammanskraal	Informal	Operational	TR195
Kekana Gardens	Kekana Gardens		Formal		
Kirkney	Makro, van der Hoff Rd	Van der Hoff Rd & Richards Bay St (N/E)	Informal	Operational	KAR002
Klipgat	Klipgat (Manpower Building)	Klipgat village	Informal	Operational	
Kloofsig	Kloofsig Station	Botha Avenue (W) Opposite Kloofsig Railway Stn	Semi Formal	Drop-off/Pick-up point	*
Laudium	Emerald St & 13th Avenue	Emerald St & 13th Avenue (W/S)	Informal	Operational	
Laudium	First Street	First Street (N) 600 metres from R55	Semi Formal	Pick-up/Drop-off Point	
Laudium	Laudium	Ninth Street(W) c/o ??	Informal	Operational	
Lynnwood Ridge	Boschkop (Lynnwood Ridge)	Freesia St & Hibiscus St (S/W)	Semi Formal	Operational	
Lynnwood Ridge	Lynnwood Ridge	Lynnwood Rd & Jacobson St (S)	Informal	Pick-up/Drop-off Point + Holding Area	

Suburb	Rank Name	Rank Location	Rank Type	Description	RANK_ID
Lyttleton	Checkers Rank	Botha Ave (W) 50 m from Cantonment St, (S)	Informal	Operational	
Lyttleton	Lyttleton Station	Botha Avenue & Station Road (W/N)	Formal	Operational	
Mabopane	Central City (OK)	Central City (OK) in Mabopane	Formal	Operational	
Mabopane	Mabopane Station B	Mabopane Station Main, N W side	Formal	Operational	
Mabopane	Mabopane Station Main	Mabopane Station Main, N W side	Informal	Operational	
Mamelodi	Denneboom A (Local Rank)	Tsamaya Road (S) Denneboom Station	Formal	Operational	
Mamelodi	Denneboom B (to Pretoria)	Tsamaya Road (S) Denneboom Station (W)	Formal	Operational	
Mamelodi	Denneboom C (Long Distance)	Tsamaya Road (S) Denneboom Station (E)	Formal	Operational	
Mamelodi	Eerste Fabrieke Station	Eerste Fabrieke Station (N)	Informal	Arrival Counts	
Mamelodi	Mahube Valley	Hans Strydom Drive (N)	Informal	Operational	
Mamelodi	Maseko West	Pitje St & Shabangu St (E/N)	Informal	Operational	
Mamelodi	Vista University	Hans Strydom Dr & Hinterland Rd (E/S)	Informal	Operational	
Menlyn	Lois Avenue (Menlyn)	Lois Ave (south bound) btn Atterbury Rd & Menlyn entrance	Informal	Holding area	
Menlyn	Lois Avenue 1	Lois Ave (north bound) btn Atterbury Rd & Menlyn Entrance	Informal	Holding area	
Menlyn	Menlyn Steps	Atterbury Rd (S) btn Lois St& Menlyn Access	Informal	Operational	
Menlyn	Menlyn Bus Stop	Lois Aveue & Atterbury Rd (W/S)	Informal	Holding area	
Menlyn	Menlyn Parking	Menlyn Shopping Centre Parking Area	Informal	Operational	
Mnandi	Mnandi	Mnandi Informal Settlement	Informal	Operational	

Suburb	Rank Name	Rank Location	Rank Type	Description	RANK_ID
Moreleta Park	Hans Strydom Drive & Old Farm Rd	Hans Strydom Drive & Old Farm Rd (E/S)	Informal	Operational	
Moreleta Park	Moreleta Park	Hans Strydom Dr & St Bernard St	Informal	Operational	
Moreleta Park	Rubenstein Drive & Garsfontein Rd	Rubenstein Drive & Garsfontein Rd (E/S)	Informal	Operational	
Nellmapius	Nellmapius Ext 4	Alwyn St & Moreri St (S/W)	Informal	Operational	
Olievenhoutbosch	Olievenhoutbosch A	Olievenhoutbosch Informal Settlement	Informal	Operational	
Olievenhoutbosch	Olievenhoutbosch B	Olievenhoutbosch Informal Settlement	Informal	Operational	
Philip Nel park	Pretoria Technikon	Staatsartillerie St & Technikon entrance (On Campus)	Semi Formal	Operational	TR024
Pretoria	11th St & Mogul St (Moloreng)	11th St & Mogul St (E/S)	Informal	Operational	
Pretoria	Andries St (to Centurion)	Andries Street (E) (btn Bloed St & Struben St)	Informal	Operational	
Pretoria	Belle Ombre	Potgieter St Extension (E) north of Boom St	Formal	Operational	
Pretoria	Bloed St & Van der Walt St	Bloed St & Van der Walt St (S/W)	Informal	Operational	
Pretoria	Bloed Street East Rank	Bloed St & Van der Walt St (S/E)	Formal	Operational	
Pretoria	Bloed Street West Rank	Bloed St & Van der Walt St (N/E)	Formal	Operational	
Pretoria	Boom St & Fifth St	Boom St & Fifth St (S/W)	Informal	Operational	
Pretoria	Boom St & Van der Walt St	Boom St & Van der Walt St (S/W)	Informal	Holding area	
Pretoria	Boom St & Van der Walt St	Boom St & Van der Walt St (N/W)	Informal	Holding area	
Pretoria	Bosman St & Scheiding St	Bosman St & Scheiding St	Informal	Operational	
Pretoria	Boston Garage	Bloed St & Prinsloo St (N/W)	Informal	Operational	

Suburb	Rank Name	Rank Location	Rank Type	Description	RANK_ID
Pretoria	Brown St & van der Walt St	Brown St & Van der Walt St (N/E)	Informal	Operational	
Pretoria	Dairy Mall Rank	Bosman St & Jacob Mare St (W/S)	Informal	Operational	
Pretoria	Dr Savage Road Rank	Dr Savage Street (S)	Formal	Operational	
Pretoria	Edgars Rank van der Walt Street	Van der Walt St & Church St East (W/S)	Informal	Operational	
Pretoria	Prinsloo St & Bloed St	Prinsloo St & Bloed St (W/S)	Informal	Operational	
Pretoria	Prinsloo St & Church St West	Prinsloo St & Church St (E/S)	Informal	Operational	
Pretoria	Prinsloo St & Proes St	Prinsloo St & Proes St (E/S)	Informal	Operational	
Pretoria	Prinsloo St (Nellmapius)	Prinsloo St (E) between Boom St & Struben St	Informal	Operational	
Pretoria	Quagga Centre, Church Street W	Quagga Street (E) Church Street West	Semi Formal	Operational	KAR063
Pretoria	Reserve Bank	Church St & Prinsloo St (N/E)	Informal	Operational	
Pretoria	Scheiding St & Bosman St	Scheiding St & Bosman St (S/E)	Informal	Operational	
Pretoria	Scheiding St & Railway St	Scheiding St & Railway St (N/E)	Informal	Operational	
Pretoria	Schubart Park	Schubart St & Proes St (W/N)	Informal	Operational	
Pretoria	Skinner Street Median Island	Skinner St East & Bosman St (N/W)	Formal	Holding area	
Pretoria	Struben Street Rank	Between Jacob Mare & Visagie	Informal	Operational	
Pretoria	Van der Walt St & Church St	Van der Walt St & Church St (W/N)	Informal	Operational	
Pretoria	Van der Walt St & Pretorius St	Van der Walt St & Pretorius St (W/N)	Informal	Operational	
Pretoria	Van der Walt St & Proes St	Van der Walt St & Proes St (W/N)	Informal	Operational	
Pretoria	Van der Walt St & Vermeulen St (Lubners)	Van der Walt St & Vermeulen St (W/N)	Informal	Operational	

Suburb	Rank Name	Rank Location	Rank Type	Description	RANK_ID
Pretoria	Van der Walt St (Top Centre)	Van der Walt (W) Between Proes & Struben	Semi Formal	Operational	
Pretoria North	Pretoria North Rank	Emly Hobhouse & Gerrit Maritz (E/N)	Semi Formal	Operational	
Rayton	Rayton		Informal		
Rethabiseng	Fourway (Rethabiseng)		Informal		
Rethabiseng	Fourway (Rethabiseng) Entrance		Informal		
Rosslyn	Rosslyn & R566	R566 (N) c/o ??	Informal	Operational	
Rosslyn	Rosslyn (Main Rank)	Piet Pretorius St (W) c/o Piet Rautenbach St	Formal	Operational	
Saulsville	Maunde St c/o Mphalane St	Maunde St & Mphalane St (S/W)	Formal	Not Utilised	TR113
Silverton	Metropolitan Mall, Silverton	Metropolitan Mall's parking area (Pretoria Rd)	Informal	Operational	
Silverton	Pretoria Rd & Simon Vermooten Rd	Pretoria Road & Simon Vermooten Rd (S/E)	Informal	Holding area	
Silverton	Silverton (Tile Africa)	Pretoria Road & Watloo St (S/E)	Informal	Operational	
Soshanguve	Rietgat Rank	Mabopane Station (Eastern Side)	Formal	Operational	
Soshanguve	Soshanguve XX	M20 Route, 150 m W from R80	Informal	Operational	
Soshanguve	Transfer	Soshanguve at BP garage opposite Caltex	Informal	Operational	
Soshanguve South	Kopanong Station	Soshanguve South Ext.14	Semi Formal		
Stinkwater	Alpha	Gamokone (S/E corner of the village)	Informal	Operational	
Sunderland Ridge	Sunderland Ridge	(R55) Voortrekker St & Elman St (W/S)	Informal	Operational	
Sunnyside	Walker St & Dougal St	Walker St & Dougal St (S/E)	Informal	Drop-off/Pick-up point	

Suburb	Rank Name	Rank Location	Rank Type	Description	RANK_ID
Temba	Jubilee Mall rank	C/o Johan Heyns (H. Verwoerd)Dr &Roohuisakraal Dr	Formal		
Temba	Mashemong	Mashemong, Temba	Informal	Operational	
Temba	Temba City	Temba City Shopping Complex	Formal	Operational	
Temba	Temba Cross roads	?? c/o Jubilee Street	Informal	Operational	
Thaba Tshwane	Thaba Tshwane	Voortrekker St (W) c/o Paul Kruger St	Informal	Operational	
The Reeds	The Reeds (Bothril)	Bothril St (E) Opposite Spar	Informal	Drop-off/Pick-up point	
The Reeds	The Reeds (Spar)	Panorama St & Alice St	Semi Formal	Drop-off/Pick-up point	
Wapadrand	Wapadrand Rd & Lynnwood Rd	Wapadrand Rd & Lynnwood Rd (W/E)	Informal	Operational	
Waverly	Waverly Shopping Centre	Cunningham St & Codonia Ave (N/W)	Informal	Operational	
Wierda Park	Wierda Park Shopping Centre	Willem Botha St & Ruimte Rd (S/E)	Formal	Operational	
Winterveld Ext.3	Winterveld	Erf no. 5097 Winterveld Ext.3 along Rooibos Ave	Informal		
Wonderboom	Wonderboom Street East	Paul Kruger St (E)	Informal	Operational	
Wonderboom	Wonderboom Street West	Paul Kruger St (W)	Informal	Operational	
Zithobeni	Zithobeni Ext 1		Informal		
Zithobeni	Zithobeni Ext 2		Informal		
Zonderwater	Zonderwater Rehabilitation Center		Informal		
Zwartkop	Zwartkop	South St & Lenchen St North (W/N)	Informal	Operational	

The available information on mini-bus taxi facilities has some information on the name and location of the facility, whether the facility is forma, semi-formal or informal, some information on the type

of operations at the facility, an ID (if applicable) and co-ordinates of the facility. In general, the information has some gaps and does not include information on the condition, age or value of the facility. From the available information, it is apparent that there are 148 mini-bus taxi facilities across the CoT; 22 of these are formal, 15 semi-formal and 11 informal. The formal ranks may have formalised accesses, be paved, have facilities such as shelters, toilets, benches, lighting, signage and have rank marshalls. The semi-formal facilities may have only one or two of these facilities whilst the informal facilities will likely have none of these and be a dustbowl adjacent to the road.

Of the 148 mini-bus taxi facilities, nine are listed as drop-off and pick-up only, 13 as holding facilities (waiting areas for taxis between routes, no passengers here), 103 as operational and 1 not utilised (in Saulsville).

B.3.2.2 Projects to Address Current Backlog and Future Demand

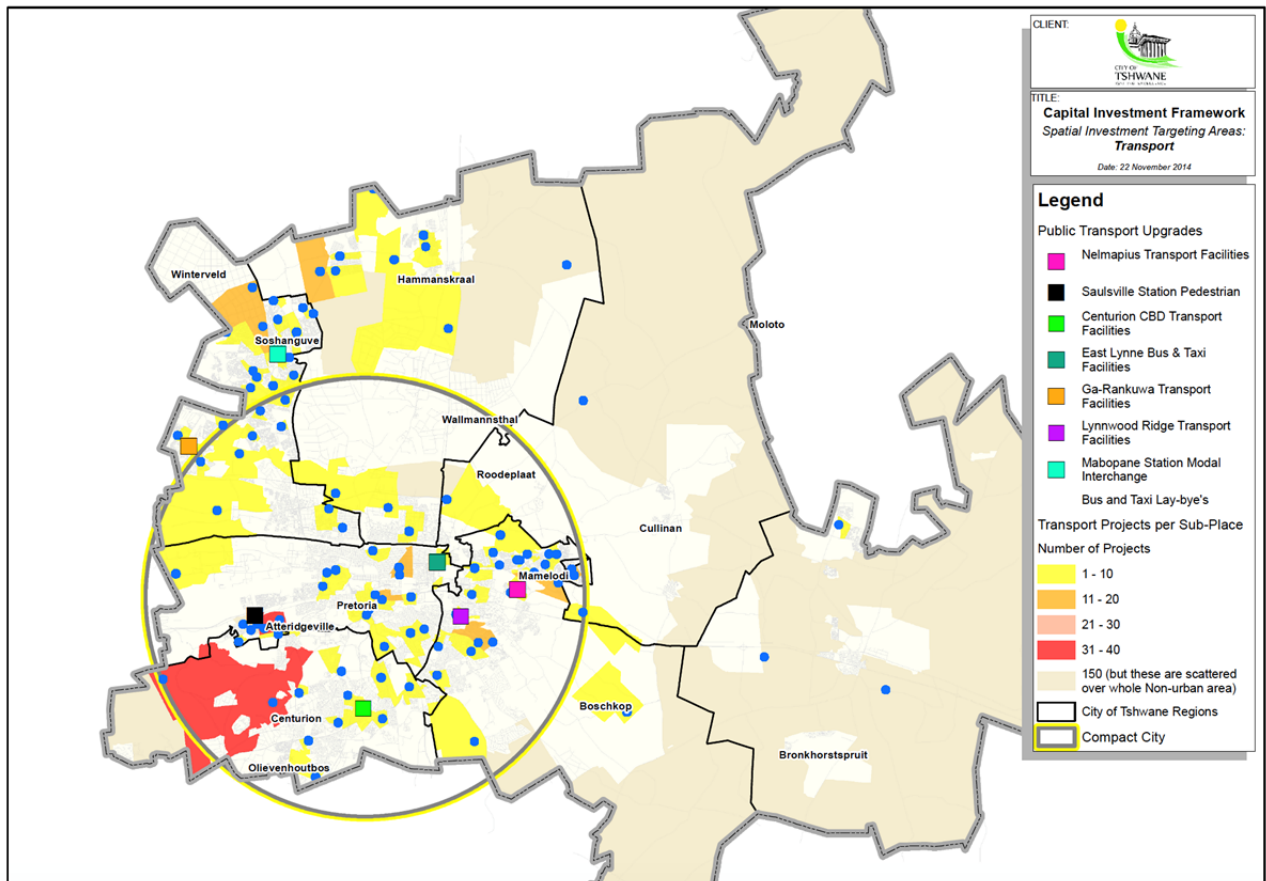
The most critical transport need and priority for Tshwane is the development of a high-quality integrated public transport system that provides sustainable and affordable mobility and access to the citizens of the City. The CoT has developed a draft integrated public transport network (IPTN) operational plan, which focuses on the rapid public transport modes, such as BRT, rail and high-quality bus, as well as non-motorised transport (NMT). The IPTN will be further refined as part of the CIP. The initial phase of the CoT's TRT system has been launched and is currently operating between the CBD and Hatfield. The IPTN Operational Plan indicates the implementation priorities for the full IPTN over the next 20 years. The IPTN is funded by National Treasury in terms of the Public Transport Systems Grant. The IPT route network constitutes an important part of the Spatial Target Areas of the City that must be supported by infrastructure development and capital expenditure.

The projects identified here address current priority needs and will be updated when the CIP has been completed by June 2015. Figure B.3.2-1 indicates the Transport projects in terms of the following categories:

- Upgrading of Public Transport Facilities, as follows:
 - Centurion CBD Transport Facilities
 - East Lynne Bus and Taxi Facilities
 - Ga-Rankuwa Transport Facilities
 - Lynnwood Ridge Transport Facilities
 - Mabopane Station Modal Interchange

- Nelmapius Transport Facilities
- Saulsville Station Pedestrian facility
- Bus and Taxi Lay-bys, distributed over the whole area of Tshwane.

Figure B.3.2-1: Spatial Target Areas for Transport Infrastructure



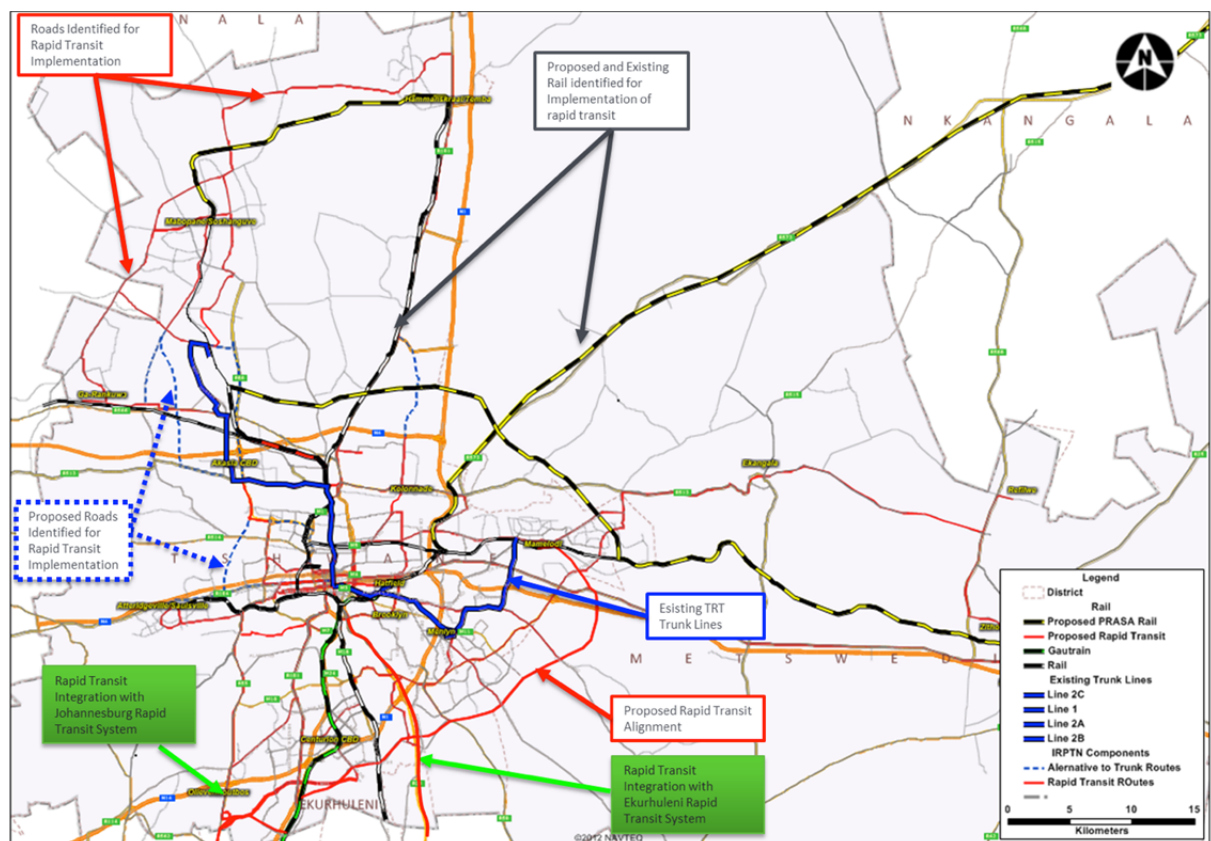
The number of projects per suburb indicate the highest number of projects in urban areas in Centurion and Atteridgeville (more than 30), followed by areas in Mabopane, Winterveld, Soshanguve, Mamelodi, the central and eastern areas of the City (11-20). There are also 150 projects in the rural areas.

The Integrated Rapid Public Transport Network (IRPTN) is shown in Figure B.3.2-2. It will be made up of passenger rail, the Tshwane Rapid Transit and the Gautrain. Figure B.3.2-3 shows the existing and proposed rapid transit network as at 2013.

Figure B.3.2-2: IRPTN Gauteng Integrated Transport Master Plan (Tshwane)



Figure B.3.2-3: Existing and Proposed Rapid Transit Network 2013



Public transport facilities that are either planned as new facilities or for upgrading shown in Table B.3.2-3. Information on the estimated value of these projects is not readily available.

Table B.3.2-3: Planned public transport facilities projects

Public Transport Facility	Upgrading/ New facility	Type of facility
Saulsville Stn - Bus/taxi intermodal facility	upgrading	Station Intermodal Facility
Denneboom Interchange - upgrade / PPP	upgrading: paving,shelters, toilets	Station Intermodal Facility
Pienaarspoort Station - intermodal facility	upgrading	Station Intermodal Facility
Greenview Station - intermodal facility	acquisition of land & facility	Station Intermodal Facility
Soshanguve Station - intermodal facilities	upgrading	Station Intermodal Facility
Kopanong Station intermodal facility	upgrading	Station Intermodal Facility
Akasiaboom Station - intermodal facility	upgrading: paving,shelters, toilets	Station Intermodal Facility
Hammanskraal bus & taxi facilities	upgrading	Station Intermodal Facility
Wonderboom Stn Intermodal	upgrading: total re-development	Station Intermodal Facility
Irene Station: intermodal facility	upgrading	Station Intermodal Facility
Samrand/PWV5/rail intermodal facility	upgrading	Station Intermodal Facility
Putco Terminus	upgrading	Bus Terminus
Bus Facility	upgrading: paving,shelters, toilets	Bus Terminus
Old Bus Terminus	upgrading	Bus Terminus
RDP Bus Terminus	upgrading	Bus Terminus
Soshanguve Technikon: bus & taxi bays	upgrading	Bus Terminus
Saulsville Taxi Rank c/o Mphalane & Maunde	upgrading	Minibus Taxi Rank
Bazaar St rank	upgrading: paving,shelters, toilets	Minibus Taxi Rank
Taxi Facility	upgrading	Minibus Taxi Rank

Dr Savage Rd Rank	upgrading: paving,shelters, toilets	Minibus Taxi Rank
Mahube Valley Taxi rank	upgrading	Minibus Taxi Rank
Balebogeng Bus Term. (relocation?)	upgrading: paving,shelters, toilets	Minibus Taxi Rank
Nellmapius Taxi Rank	upgrading	Minibus Taxi Rank
Taxi Rank	upgrading	Minibus Taxi Rank
Lynnwood Ridge taxi rank	upgrading	Minibus Taxi Rank
Khotso Taxi facility	upgrading	Minibus Taxi Rank
Ga-Rankuwa "no mans land" taxi rank	new: paving & shelters	Minibus Taxi Rank
Station A, Soshanguve - intermodal facility	upgrading	Minibus Taxi Rank
Rossllyn taxi rank	upgrading	Minibus Taxi Rank
Temba taxi facilities	upgrading: paving & shelters	Minibus Taxi Rank
New Eersterust	upgrading	Minibus Taxi Rank
Laudium taxi rank CBD	upgrading	Minibus Taxi Rank
Wierda Park intermodal facility	new: paving & shelters	Minibus Taxi Rank
Olievenhoutbosch PT facilities	upgrading	Minibus Taxi Rank
The Reeds: Panorama St	new: paving & shelters	Minibus Taxi Rank
Pierre v Ryneveld shops	upgrading	Minibus Taxi Rank
Bronkhorstspuit Taxi Rank -	upgrading: paving,shelters, toilets	Minibus Taxi Rank
Ekgangala Taxi Rank	upgrading: paving,shelters, toilets	Minibus Taxi Rank
Refilwe Taxi Rank	upgrading	Minibus Taxi Rank
Bus facilities east of Maunde St	upgrading: paving,shelters, toilets	Bus & Taxi Terminus
Taxi facilities east of Maunde St	upgrading	Bus & Taxi Terminus

Hartbeesspruit Stn bus & taxi facility	upgrading	Bus & Taxi Terminus
Erasmus Bus & Taxi facility	upgrading: paving,shelters, toilets	Bus & Taxi Terminus
Ga-Rankuwa Hosp. bus & taxi facility	acquisition of land (R0.7m) & facility	Bus & Taxi Terminus
Sunderland Ridge intermodal facility	upgrading	Bus & Taxi Terminus
Centurion CBD intermodal facilities	upgrading: paving,shelters, toilets	Bus & Taxi Terminus
Cowie St Holding area	upgrading: paving,shelters, toilets	Bus & /or Taxi Holding Area
Nana Sita St Holding area	upgrading	Bus & /or Taxi Holding Area
Dairy Mall Taxi Rank - holding area	upgrading: paving,shelters, toilets	Bus & /or Taxi Holding Area
Wingate Park PT holding facilities	new: paving & shelters	Bus & /or Taxi Holding Area
Menlyn PT holding areas	upgrading	Bus & /or Taxi Holding Area
Hennops Park - PT holding areas	upgrading	Bus & /or Taxi Holding Area

The above projects are mostly aimed at upgrading existing public transport facilities, however they do include five projects for new facilities. These are one in Mamelodi (at Greenview Station), two in Ga-rankuwa, one in The Reeds and one in Wingate Park. Eleven of these projects include intermodal facilities at train stations, which will assist towards providing an integrated public transport network within CoT i.e. allowing passengers to use and transfer between more than one mode of transport, for example between train and bus or between train and taxi.

B.3.2.3 Non-Motorised Transport (NMT)

The complete NMT network was developed after superimposing the IRPTN NMT network, with the Regional NMT Master Plan Network and the Metropolitan NMT Master Plan Network. Some of the routes of the Regional and Metropolitan network were similar as those identified for the IRPTN NMT Master Plan.

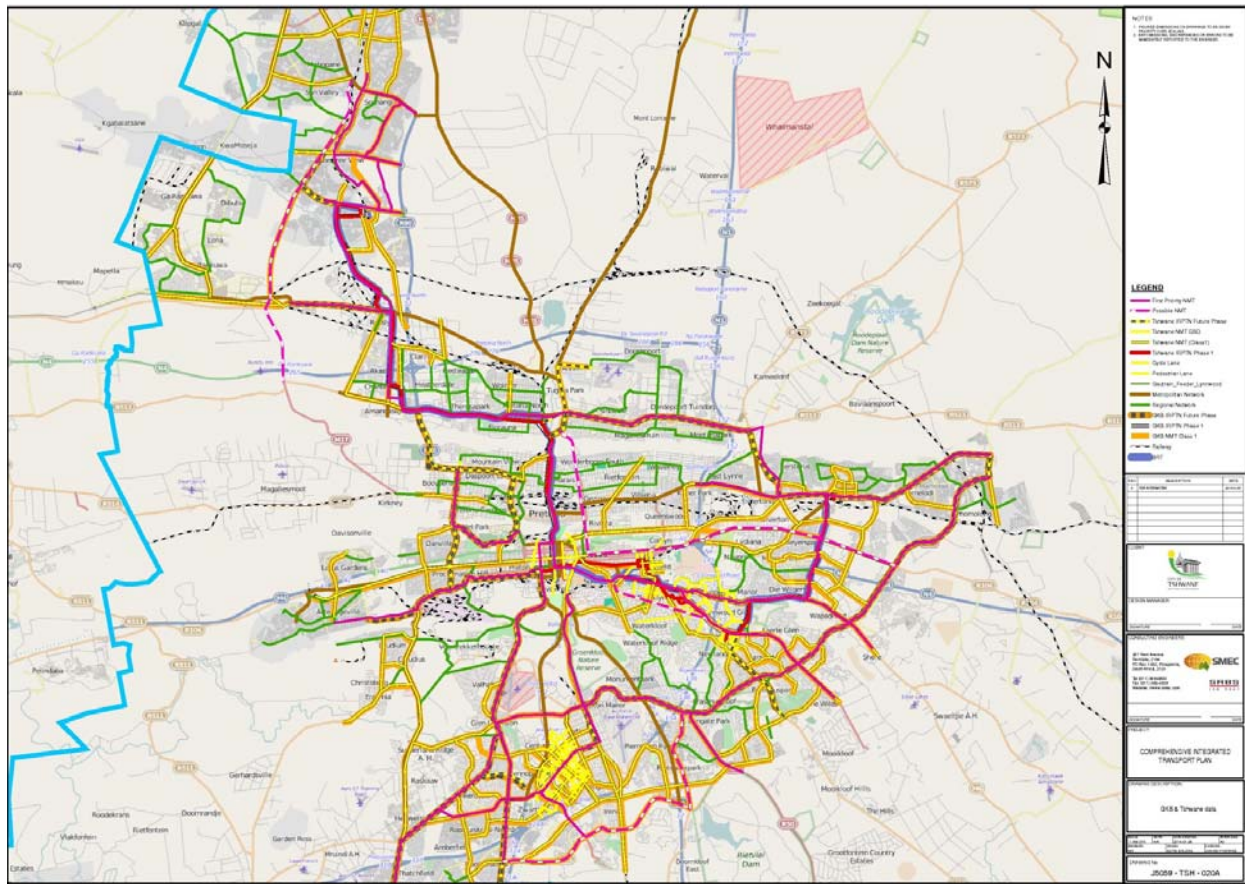
The links and lengths of the Regional and Metropolitan Network, as well as the IRPTN Network, are summarised below and the network is shown in Figure B.3.2-4:

Table B.3.2-4: Summary of links and lengths of NMT network

NMT NETWORK	LENGTH (M)
Regional NMT Masterplan Network	386 460
Metropolitan NMT Masterplan Network	613 430
IRPTN Future Phase NMT (might include some Regional / Metropolitan networks)	1 150 670
IRPTN NMT Priority for Implementation	302 360

There is some available information on planned NMT projects, per regions, which follows, however the information does not include such things as estimated value of the projects, priority of the projects in relation to each other and whether and which projects have been approved or not.

Figure B.3.2-4: Complete and Prioritised NMT Network



B.3.2.3.1 Region 1: Mabopane/Soshanguve/Akasia

NMT facilities in this region have to facilitate longer distance bicycle movements between these nodes as well as shorter distance pedestrian movements around and in the immediate vicinity of the significant nodes and public transport facilities.

The Metropolitan Bicycle Network as well as the IRPTN NMT Network (Class 3 routes) has been assessed to ensure that Class 3 NMT facilities have been developed to radiate out from significant centres and to interface with public transport. The priority NMT projects in this region are:

- Along the BRT Phase 1 trunk route and any major centres leading towards this route, especially in the Rosslyn industrial area. NMT facilities have been completed around the Kopanong station in Soshanguve South as part of the BRT Phase 1 implementation.
- Railway Stations of Mabopane, Garankuwa and Klipkruisfontein and routes leading towards these railway stations such as Mabopane Road in Soshanguve which carries over 6400 pedestrians in the peak period. There is a significant amount of cyclists who cycle and park their bicycles at the Klipkruisfontein PRASA station from surrounding areas such as Garankuwa

and Mabopane. These cyclists need to be adequately provided for in terms of appropriate infrastructure (lanes and parking).

- Linkages to the Tshwane University of Technology Campus are required from an NMT perspective

Furthermore to the network formulation, the following additional measures need to accompany the implementation of these NMT facilities:

- All locations need to ensure continuity of NMT infrastructure and safe crossings of all barriers such as major roads and railway lines.
- Class 4 secondary NMT routes around all schools and smaller shopping centres in the region.
- Bicycle parking sheds must be developed at all railway stations, bus termini and bus stops.
- Bicycle rental facilities can be considered at destinations such as Rosslyn and Pretoria North and the employer organisations in Rosslyn need to be targeted with a view to improving NMT facilities.
- Table B.3.2-5 below shows a breakdown of proposed NMT projects by location and length.

Table B.3.2-5: NMT Priority Streets for Implementation - Region 1

Street Name	Length (m)	NMT Type
Mogwane	1860	First Priority NMT
Hebron	4110	First Priority NMT
Commissioner	3076	First Priority NMT
Ruth First	3574	First Priority NMT
Aubrey Matlala	3591	First Priority NMT
Mohlono	2897	First Priority NMT
Doreen	11479	First Priority NMT
Rachel de Beer	7711	First Priority NMT
Heinrich	658	First Priority NMT
Dale	685	First Priority NMT
Mokhele	7250	First Priority NMT
Medunsa	5417	First Priority NMT

Furthermore to the network formulation, the following additional measures need to accompany the implementation of these NMT facilities:

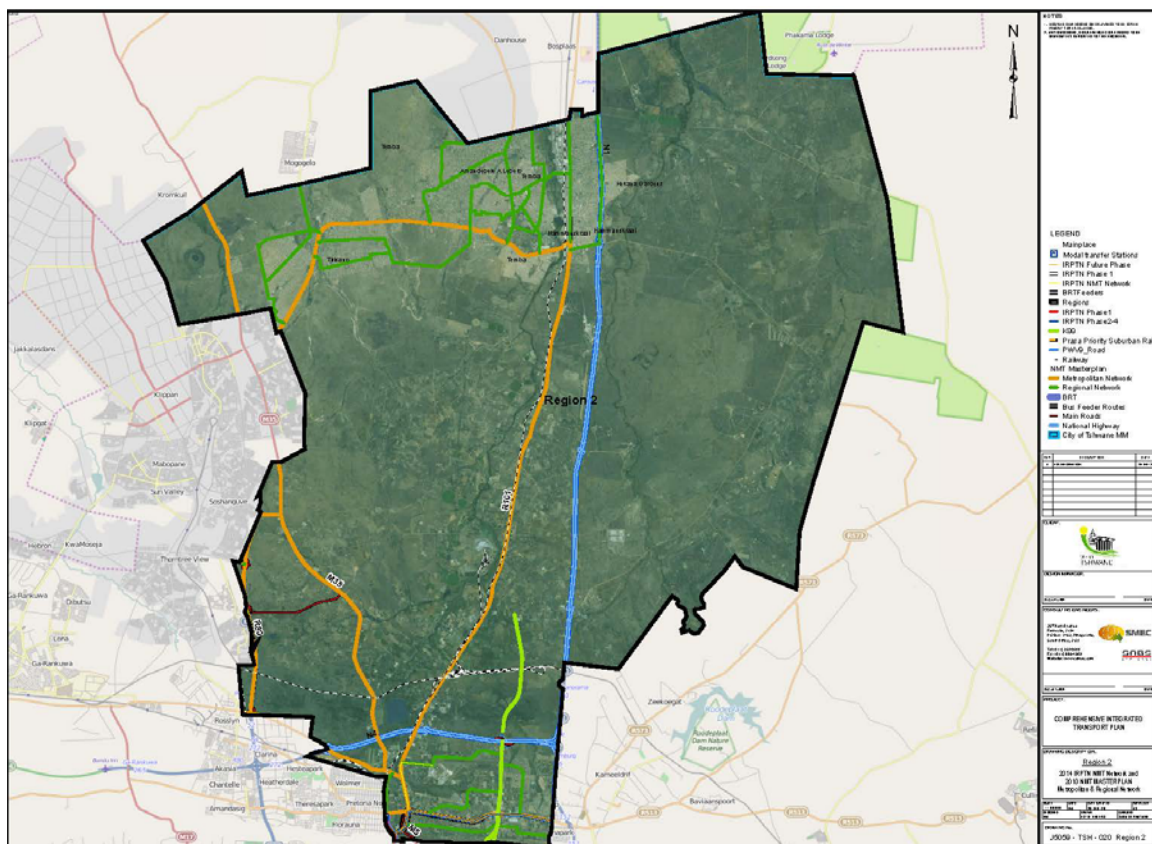
- Class 4 routes are planned around all schools and smaller shopping centres in the region.
- Bicycle parking sheds must be developed at all railway stations, bus termini and bus stops.
- Table B.3.2-6 below shows a breakdown of the streets in Region 2 along which NMT projects have been proposed.

Table B.3.2-6: NMT Priority Streets for Implementation - Region 2

Street Name	Length (m)	NMT Type
Footpath	1126	First Priority NMT
Safeko Makgatho	7135	First Priority NMT

Figure B.3.2-6 below shows the planned NMT network for Region 2.

Figure B.3.2-6: Region 2 NMT Network



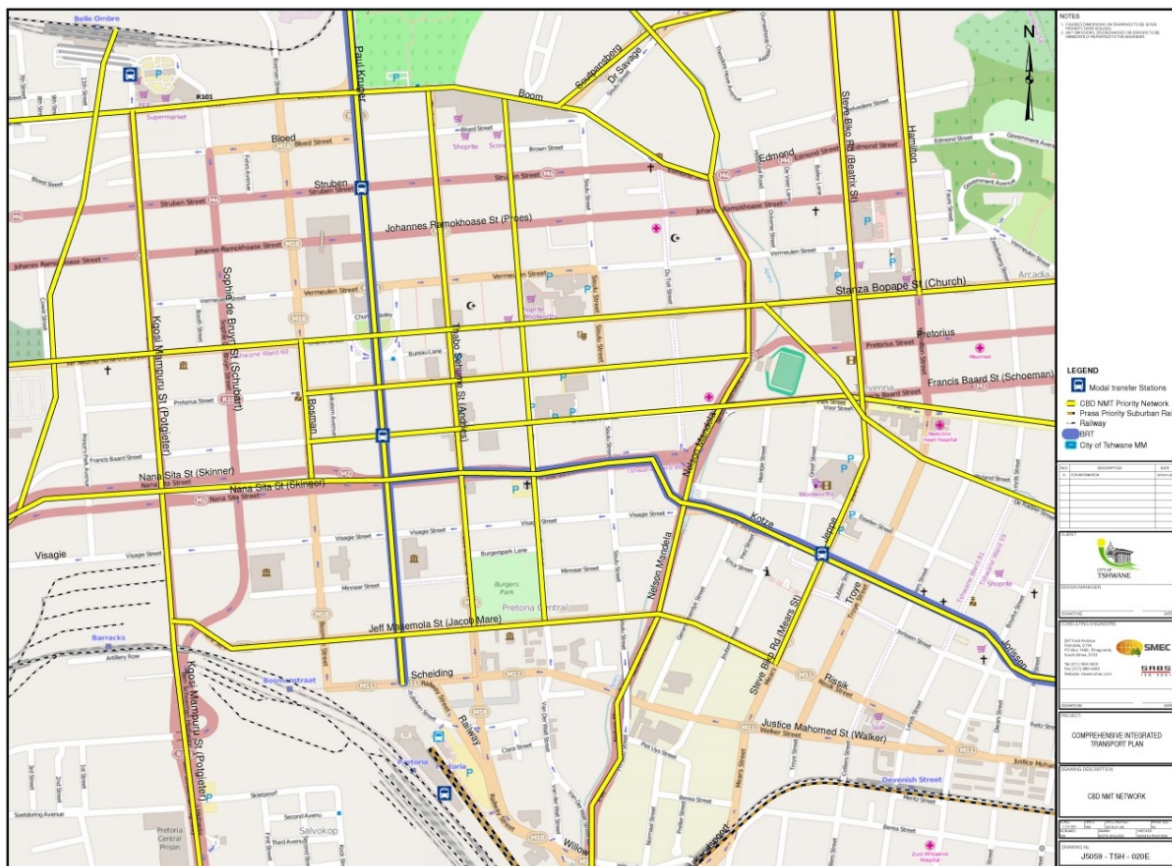
From the limited available information it can be deduced that a minimum of 8261km of NMT facilities has been proposed for this region. The estimated cost thereof is not available.

B.3.2.3.3 Region 3: Attridegeville – CBD – Brooklyn

Priority NMT implementation projects in Region 3 should focus on:

- The CBD of Tshwane is leading the way as an example of priority NMT implementation and promotion. This will be instrumental in promoting Tshwane as a walkable and cycleable City. The CBD is an extensive 3km square area which accommodates pedestrians and cyclists, as well as public transport NMT users including the increasing number of residents in the central area. With the improved public transport systems being implemented, the segregation of NMT with general vehicle traffic will ensure a much safer interface and holistic NMT environment. Consideration has been given to make certain streets NMT priority streets to facilitate the development of safe Class 3 routes. These streets include Park Street as well as the Operation Reclaim CBD rejuvenation pedestrian projects. Currently the City has implemented NMT infrastructure (shared but separated cyclist and pedestrian lanes) along Nina Sita as part of the BRT implementation project. See Figure B.3.2-7 below.

Figure B.3.2-7: CBD NMT Network

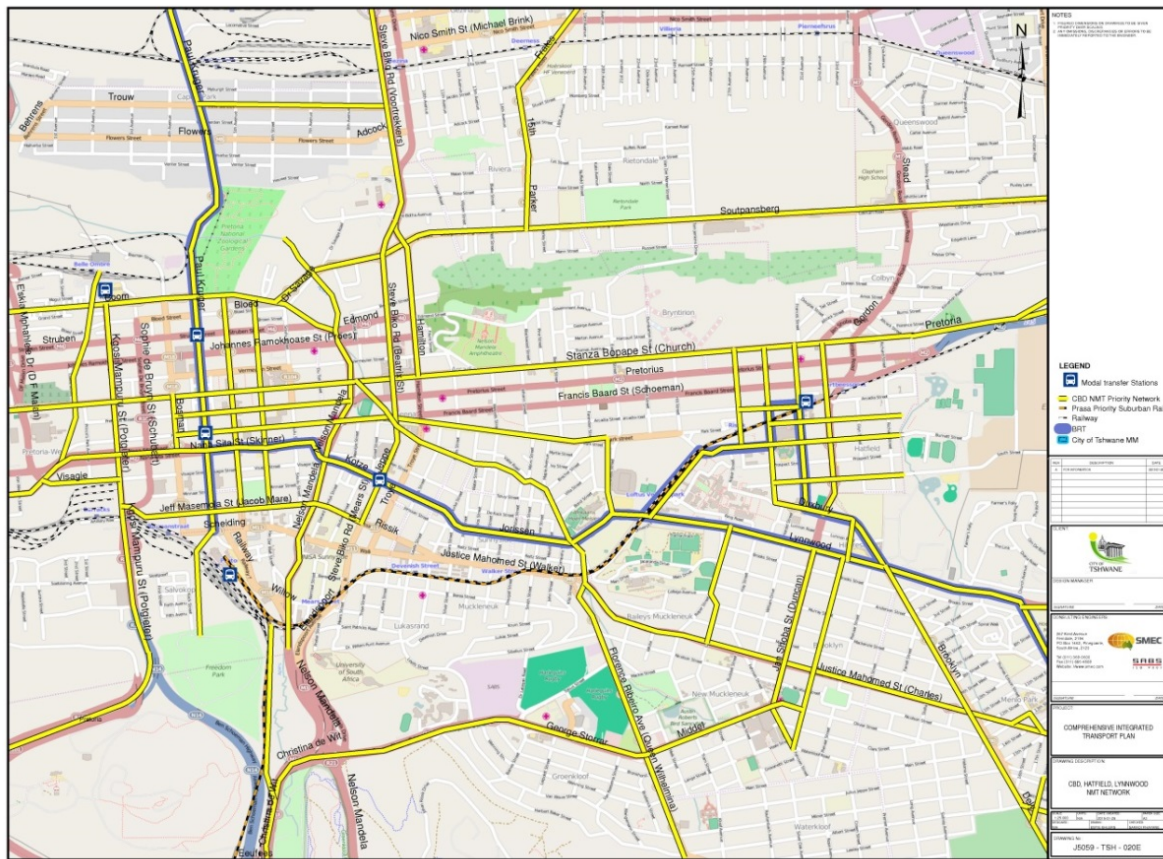


- The Hatfield node is a key NMT node for both students and businesspersons alike. With the concentration of key public transport (Gautrain and BRT) in this node, the development of key

corridors is essential, these being the pedestrianisation of Burnett Street, Hilda Street and Festival Streets. Festival Street recorded pedestrian volumes of over 3000 in the peak period. See Figure B.3.2-8.

- Lynnwood also has significant pedestrian demand; mainly those who use public transport and have NMT as their last mile trip. The priority NMT project in Lynnwood is along the BRT trunk route implementation project, as well as along Justice Mahomed, where a pilot cycle lane has been identified for implementation. See Figure B.3.2-8.

Figure B.3.2-8: CBD, Hatfield, Lynnwood NMT Network



- Table B.3.2-7 below gives a breakdown of proposed NMT facilities within Region 3.

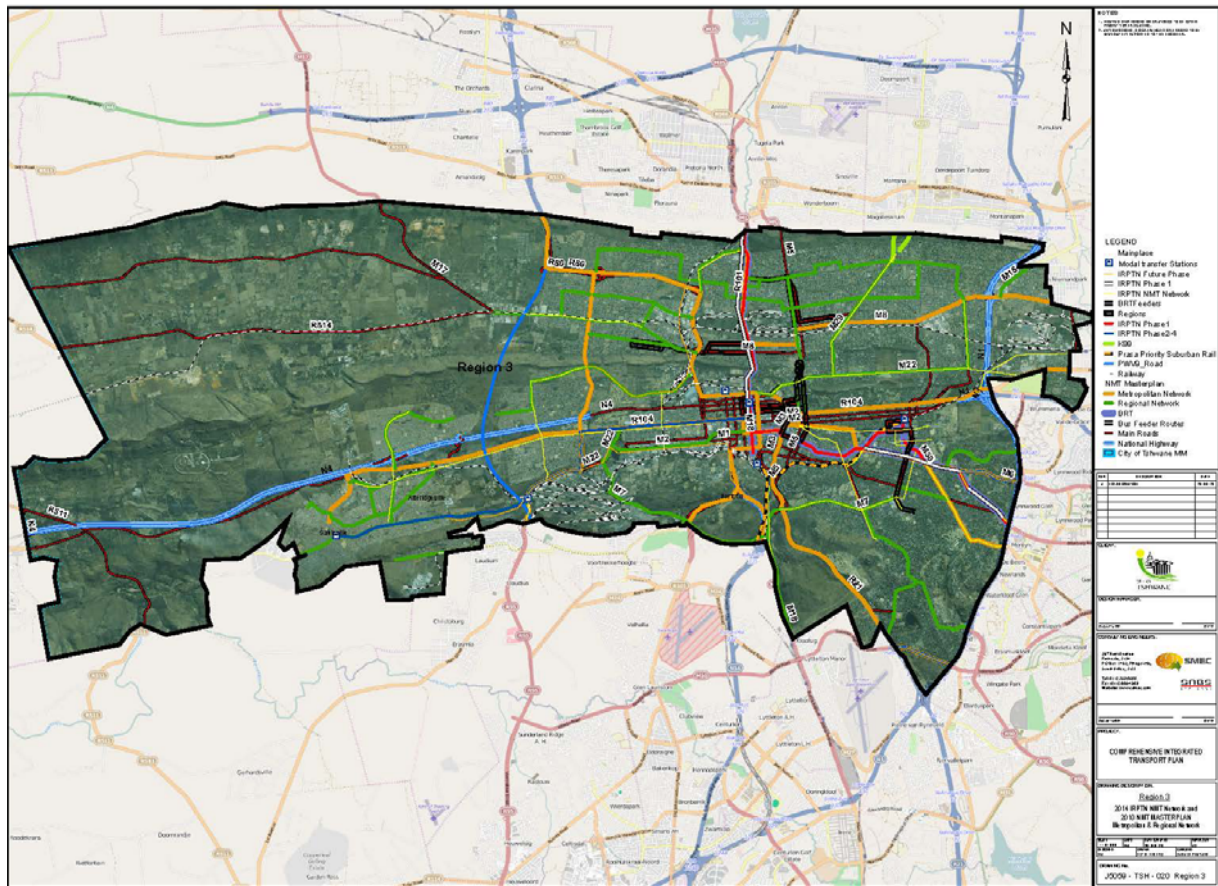
Table B.3.2-7: NMT Priority Streets for Implementation - Region 3

Street Name	Length (m)	NMT Type
Christiaan de Wet	5510	First Priority NMT
Staatsartillerie	4053	First Priority NMT
Paul Kruger	6849	First Priority NMT
Maunde	4513	First Priority NMT

Charlotte Maxeke	3952	First Priority NMT
R55	3543	First Priority NMT
Bremer	3067	First Priority NMT
Kgosi Mampuru	2805	First Priority NMT
Boom	672 2464	First Priority NMT First Priority NMT
Lynnwood	9137	First Priority NMT
Atterbury	2424	First Priority NMT
Solomon Mahlangu	3054	First Priority NMT
Stormvoel	3654	First Priority NMT
Steve Biko	6975	Possible NMT
Stanza Bopape	6262	Possible NMT
Justice Mahomed	5366	Possible NMT

Figure B.3.2-9 below illustrates the extent of the proposed NMT network in Region 3.

Figure B.3.2-9: Region 3 NMT Network



From the limited available information it can be deduced that a minimum of 74 300km of NMT facilities has been proposed for this region. Of this, roughly 56 000km is considered a first priority with the remaining estimated 18 600km considered as a possible project. It is unknown whether these projects have been approved. The estimated cost thereof is not available.

B.3.2.3.4 Region 4: Irene – Centurion – Olievenhoutbosch

Priority NMT implementation projects in Region 4 should focus on:

- NMT implementation projects linking Olievenhoutbosch to the Centurion CBD and surrounds.
- Arterials that run from the south west to the centre of Centurion and north towards the CBD of Pretoria.
- Further arterials should facilitate NMT connections between the PRASA railway station in Centurion; the Gautrain station as well as the future IRPTN trunk route to the Centurion CBD NMT network. See Figure B.3.2-10 and Figure B.3.2-11.

- Table B.3.2-8 below gives a breakdown of proposed NMT facilities and their locations within Region 4.

Table B.3.2-8: NMT Priority Streets for Implementation - Region 4

Street Name	Length (m)	NMT Type
Station Road	1062	First Priority NMT
Gerhard Street	1151	First Priority NMT
Gerhard Street	1917	First Priority NMT
Ruimte	8095	First Priority NMT
John Vorster	3497	First Priority NMT
Hendrik Verwoerd	5026	First Priority NMT
	9736	First Priority NMT
Old Johannesburg	3355	First Priority NMT
Wierda	4879	First Priority NMT
Trichardt	2648	First Priority NMT
Botha	2882	First Priority NMT
R511	6527	First Priority NMT
Footpath	857	First Priority NMT
Nellmapius	11633	Possible NMT
Boeing	5446	Possible NMT

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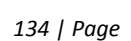
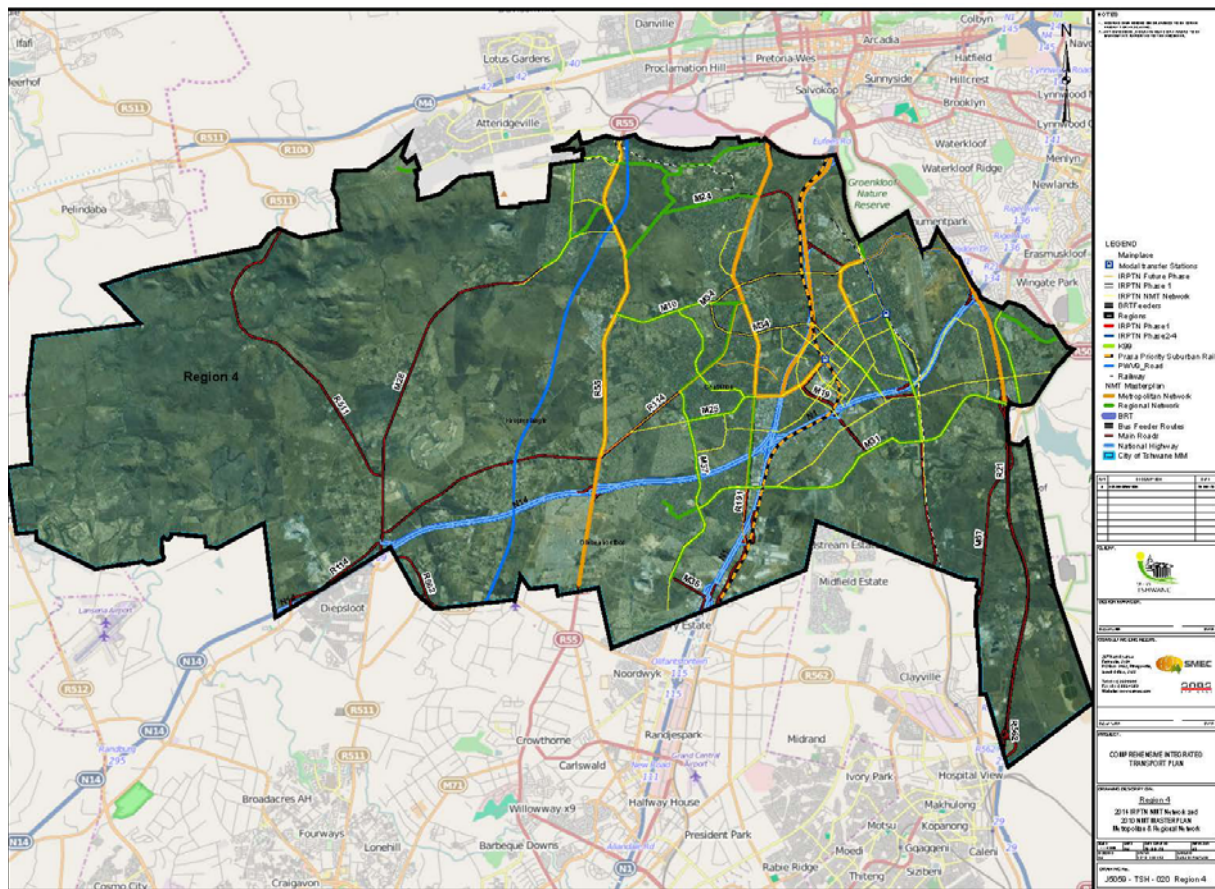


Figure B.3.2-11: Region 4 NMT Network



From the limited available information, it can be deduced that at minimum 68 711km of NMT facilities are proposed in Region 4. Of these roughly 51 600 are first priority, with an additional estimated 17 000 being a second priority.

It is not known what the estimated costs of these proposals are and whether they have been approved.

B.3.2.3.5 Region 5: Ekangala

The NMT network in Region 5 will mainly be along the activity street that was identified as part of the Regional Spatial Development Frameworks, 2013. Due to the sparse population densities of the region, the focus in this region should be on promoting accessibility between the communities and the Ekangala / Ekandastria area, the Bronkhorstspuit area, as well as the greater Tshwane economic development areas.

Connections also need to be facilitated between Refilwe and Cullinan, to encourage the economic development of Refilwe. See Figure B.3.2-12 for an illustration of the proposal extents and Table B.3.2-9 below for a breakdown of the proposed projects.

Figure B.3.2-12: Region 5 NMT Network

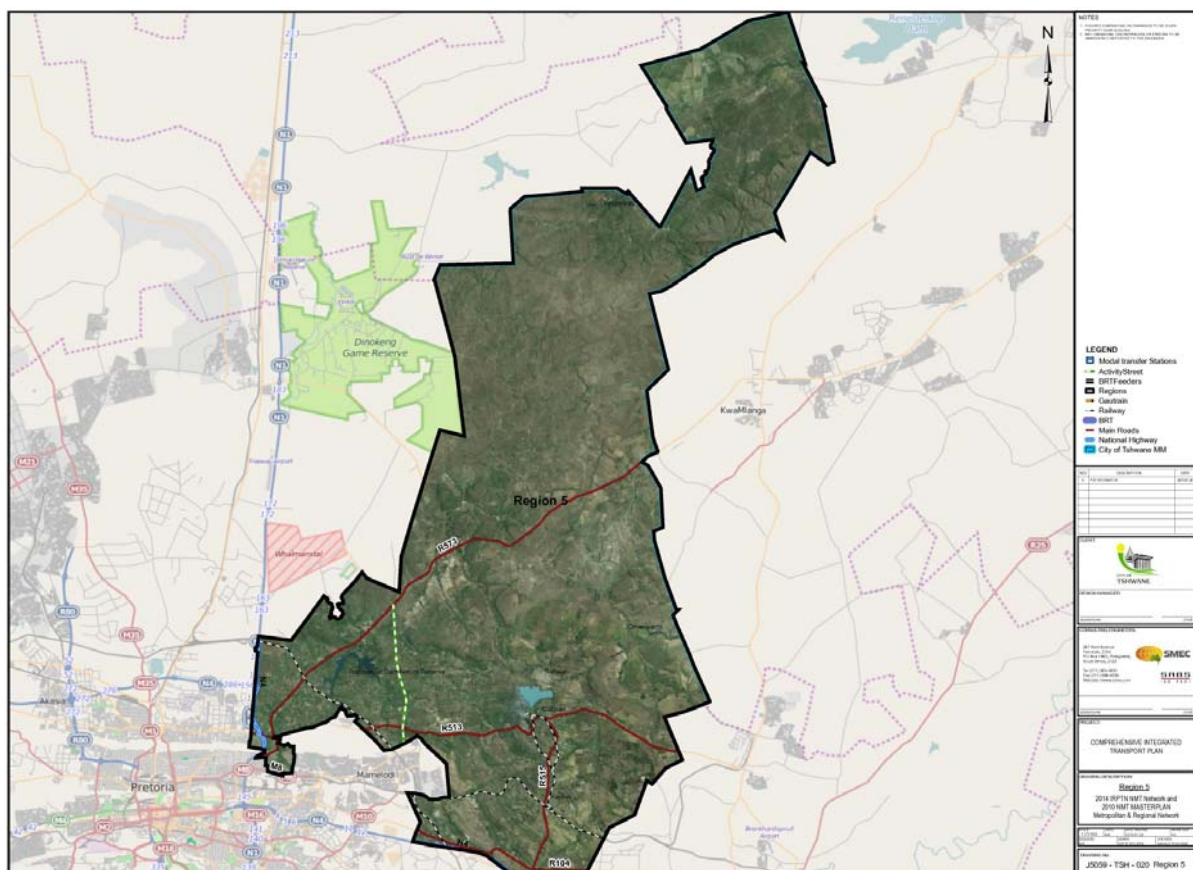


Table B.3.2-9: NMT Priority Streets for Implementation - Region 5

Street Name	Length (m)	NMT Type
Footpath	3208	First Priority NMT
Hans Covendale	900	First Priority NMT
Safeko Makgatho	3631	First Priority NMT

From the limited available information it can be deduced that, at minimum, 7 739km of NMT facilities have been proposed as priority projects within Region 5. The cost estimates of those projects are not known, it is also not known whether these proposals have been approved.

B.3.2.3.6 Region 6: Mamelodi – Menlyn

NMT arterials should facilitate east-west movement as well as north south movement and that area provides good opportunity to develop a grid-type NMT network that can facilitate movements to all significant areas

Surveys undertaken for the CIP in 2013 reveal that the following strategic NMT corridors exist and should be prioritised for implementation:

- N4 / Solomon Mahlangu Drive from Mamelodi, which recorded over 1800 pedestrians and 800 cyclists within the peak period.
- Eeste Fabrieke area in Mamelodi which had over 1900 pedestrians in the peak period, and which will link into the PRASA station and the future Gautrain station in the region.
- Tsamaya Avenue in Mamelodi also carries a significant amount of cyclists in the peak period (142) as well as pedestrians (2467). Infrastructure has been provided along Tsamaya Avenue and will be upgraded as part of the BRT Phase 1 trunk route project.
- The Menlyn node is a priority NMT node, facilities along all major public transport routes within the precinct. This includes looking at various methods to link pedestrians to the precinct.

See Figure B.3.2-13 and Figure B.3.2-14, along with Table B.3.2-10 for a depiction and breakdown of the NMT projects within Region 6.

Figure B.3.2-13: Region 6 Mamelodi - Menlyn



Figure B.3.2-14: Region 6 NMT Network

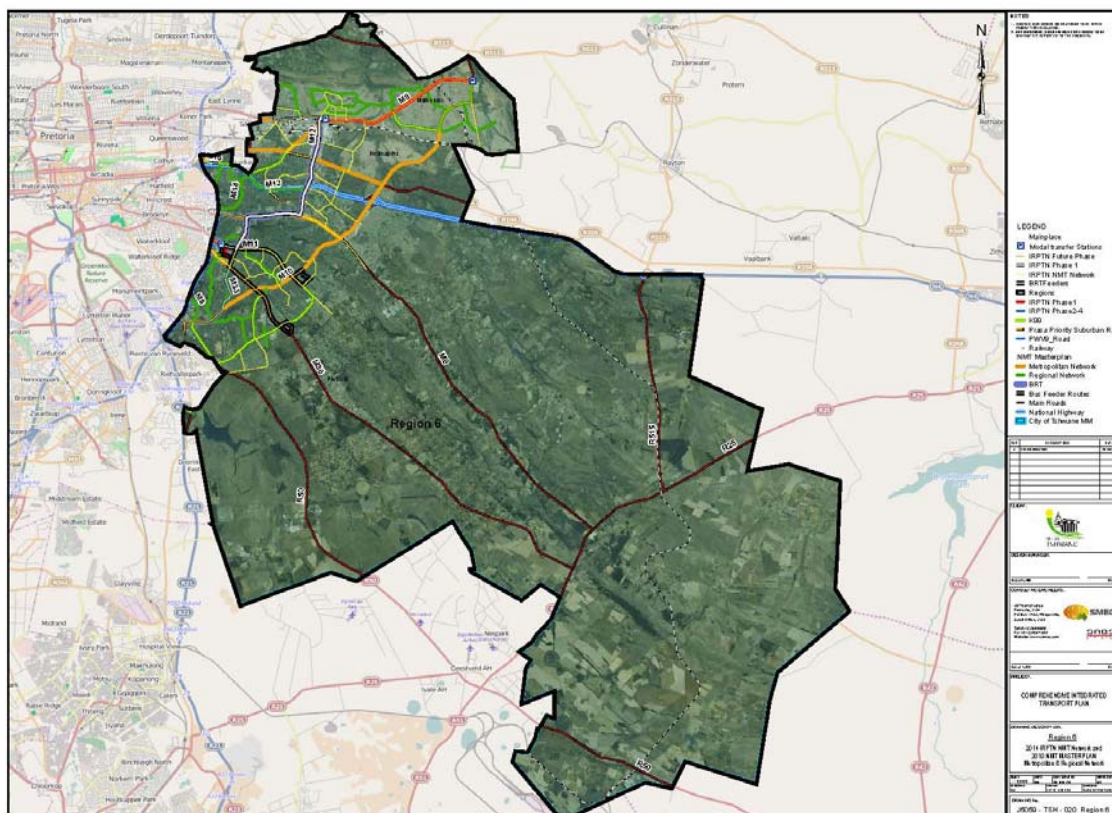


Table B.3.2-10: NMT Priority Streets for Implementation - Region 6

Street Name	Length (m)	NMT Type
Solomon Mahlangu	22494	First Priority NMT
Delmas	4385	First Priority NMT
Lynnwood	7370	First Priority NMT
Atterbury	8026	First Priority NMT
Simon Vermooten	5868	First Priority NMT
Tsamaya	9436	First Priority NMT
Graham	1874	First Priority NMT
Stormvoel	3539	First Priority NMT
Pretoria	10588	Possible NMT

From the limited information available, it can be deduced that a minimum of 73 580km of NMT facilities has been proposed for Region 6. This can be broken down in roughly 63 000km of first priority NMT proposals, with the remaining 10 600km being a second priority. The estimated cost of these proposals is not known. It is also not known if these proposals have been approved.

B.3.2.4 Parking

The City of Tshwane has a number of parking problems and challenges. They range from the unavailability of on-street parking, illegal use of parking bays, double and triple parking and general non-compliance to restrictions.

A parking policy and strategy for the City of Tshwane is currently being developed as a part of the Comprehensive Integrated Transport Plan (CITP). As the name suggests, it is an integrated approach to solving the transportation problems, taking into account public transport, travel demand management measures and non-motorized transport. However, the CITP is a 5-year process and the outcomes and interventions proposed may not be immediately implementable. Due to the timeline and funding, the CITP is a medium to long-term strategic plan. The immediate day-to-day problems remain unaddressed.

There are proposals to address parking challenges in Region 3, which are detailed below.

B.3.2.4.1 Region 3: Attitudegeville – CBD – Brooklyn

Streets expected to be closed by the municipality include Paul Kruger, Madiba (Vermeulen) and Lilian Ngoyi streets as part of its Operation Reclaim project. It is proposed that Paul Kruger Street be closed to all types of traffic between Nana Sita (Skinner) and Boom streets to facilitate the implementation of the municipality's Bus Rapid Transit system. There are concerns that the project will cause congestion and force motorists to park on pavements and loading zones. The potential outcome of this is that the existing problems with on-street parking in the CBD could get worse. Other problems observed in the CBD related to the issues of illegal parking areas in loading zones as well as double parking thus causing severe traffic congestion and traffic flow problems in the CBD.

The projects being implemented in the CBD that might have an impact on parking are:

- Operation Reclaim
- Tshwane Rapid Transit
- Inner City Master Plan
- Relocation of taxi ranks and holding areas
- Comprehensive Integrated Transport Plan (CITP)
- Urban Traffic Control with Parking Guidance and Variable Message Signs
- Survey Conducted for TRT
- A reconnaissance survey of parking conditions in CBD
- Other initiatives and documents

The aforementioned studies are further described below:

- Tshwane Rapid Transit - Phase 1 of the Tshwane Rapid Transit is currently being implemented. The phase 1 of the TRT runs through the CBD, along Paul Kruger Street. Due to the limited right of way available, it was proposed that the on-street parking be removed along the trunk route. This leads to further reduction in the number of on-street parking spaces available in the CBD, adding to the existing problem.
- Operation Reclaim - Operation Reclaim involves pedestrianizing of streets and closure for vehicular traffic. The aim of Operation Reclaim is to create a friendly environment in the heart of the CBD for pedestrians and reduce vehicular traffic. Parking is also removed, and it will impact on traffic and parking operations. Although, it is a great initiative from a non-motorised

point of view, beside reduction in the number of on-street parking spaces, it also restricts access to parking garages in the area.

Figure B.3.2-15 below indicates the Operation Reclaim area.

Figure B.3.2-15: Operation Reclaim area

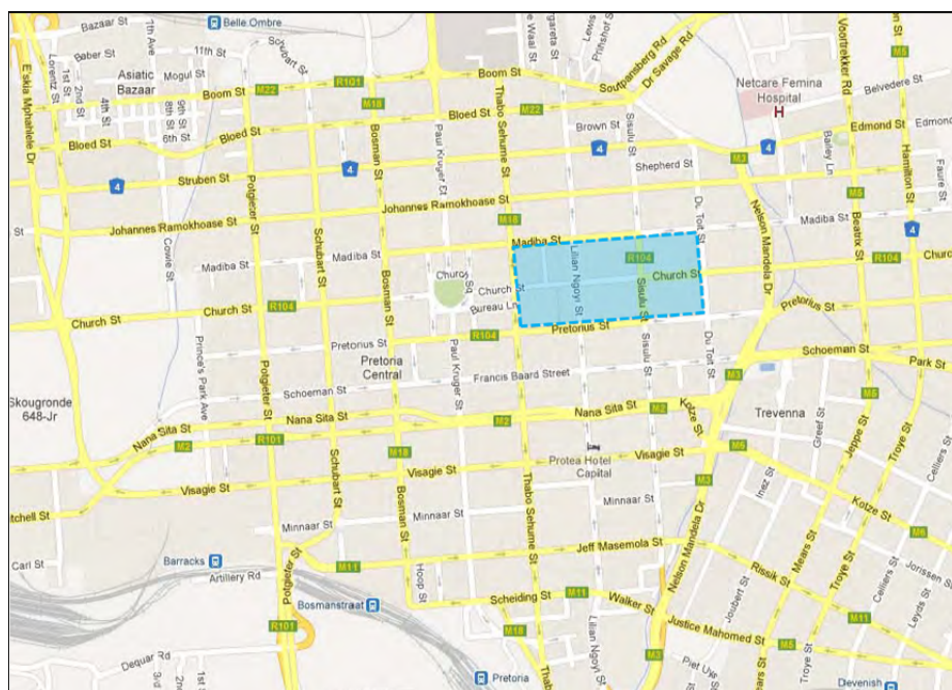


Table B.3.2-11 below indicates the total on-street parking available in the Operation Reclaim area and the number of parking lost, post implementation.

Table B.3.2-11: Parking lost due to Operation Reclaim

NAME OF STREET	PARKING SUPPLY		PARKING LOSS	
	BEFORE OPERATION RECLAIM	AFTER OPERATION RECLAIM	QUANTITY	PERCENTAGE
Madiba Street	58	10	48	83%
Church Street	18	0	18	100%
Pretorius Street	97	24	73	75%
Thabo Sehume Street	26	19	7	27%
Lilian Ngoyi Street	24	0	24	100%
Sisulu Street	18	0	18	100%
Du Toit Street	25	12	13	52%

TOTAL	266	65	201	76%
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According to the table, about 76% of the on-street parking will be lost due to Operation Reclaim.

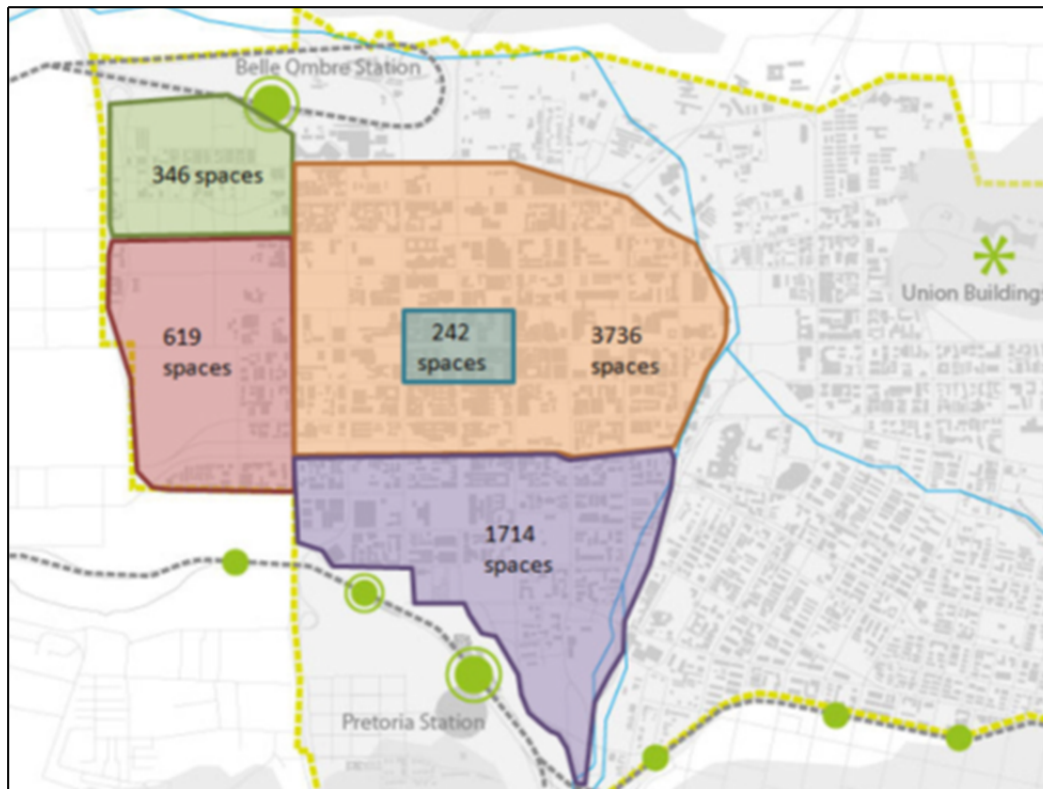
- Inner City Master Plan – A comprehensive study was conducted to develop an integrated transport plan for the inner city of Tshwane. Based on the study, it was found that there are a total of 6,650 on-street parking spaces in the CBD. The total numbers of structured and open-space parking were found to be 25,700 and 3,850 spaces, as summarised below in Table B.3.2-12:

Table B.3.2-12: Parking inventory in the CBD - existing bays

CATEGORY	PUBLIC	PRIVATE	TOTAL
On-Street Parking	6,650	-	6,650
Structured Parking	9,400	16,300	25,700
Open-spaces Parking	2,850	1,000	3,850
Total	18,900	17,300	36.200

The study took into consideration vehicular traffic, pedestrians and public transport. As a part of the study, utilisation of the parking garages were surveyed, which provides crucial insight for this study. Figure B.3.2-16 below indicates the total number of parking spaces in the CBD.

Figure B.3.2-16: Total on-street parking spaces in the CBD



Source: *Transport Master Plan for Inner City of Tshwane* (2012, Arup)

- Relocation of Taxi ranks – In the inner city transport framework, it was identified that the taxi hold both on-street and along the sidewalks, taking away capacity and impeding movement of pedestrians and cyclists. In spite of being with close proximity of taxi ranks, taxis continue to hold illegally on the street. The City of Tshwane is currently developing a plan to identify plausible locations for taxi holding areas.
- Urban Traffic Control (UTC) – A UTC System is currently being implemented in the City, which in its simplified form, comprises of a central control room for monitoring, managing and regulating traffic flow by managing traffic signal controlled intersections. As a part of the UTC, the traffic signals along the TRT mainline and areas adjacent to the TRT are being upgraded to have adaptive signal control. Transit signal priority along the BRT trunk lines will also be implemented.
- Tshwane Rapid Transit (TRT) - The TRT also include the implementation of parking guidance signs in the CBD. These signs, posted at strategic locations, will provide drivers with information on real-time parking availability in parking garages.

The strategies and interventions are summarized below:

Strategy 1: Parking Governance

- Establish a Joint Operations Committee
- Draft an Memorandum of Understanding between City and parking garage operators

Strategy 2: Better Utilisation of Resources (Technology & Parking Supply)

- City to provide guidance on rates for parking garages
- Use parking guidance sign to show available space to increase utilisation
- Use off-street parking as overflow lots to accommodate spill over of cars from on-street parking.

Strategy 3: Better enforcement & zero tolerance

- More police officers and equipment for enforcement.
- Investigate the possibility of developing a by-law on clamping of vehicles.
- Consider increasing the number of parking bays per marshal and the number of marshals per officer.

Strategy 4: Parking is not free

- Implement paid on-street parking in the CBD.
- Implementation of the handheld meters should be expedited.
- On-street parking rates should discourage long term parking.
- Determination of the on-street and off-street rates should be done in conjunction with each other and depending on the public transport available.
- Link handheld meters to a central Intelligent Transport System with real-time feed. This is part of the law enforcement investigation that will only be implemented in the longer term.

Strategy 5: Use of advance infrastructure & technology

- Implement hand-held meters
- Improve sidewalks and other NMT facilities
- Implement security cameras and deploy guards to make the streets safer
- Implement bollards and kerbs to prevent illegal parking

Strategy 6: Promote public transportation

- Review off-street parking rates based on public transport availability

- Conduct a feasibility study for the viability of a shuttle service in the CBD
- Investigate and identify site for park & ride sites in the long run.

Strategy 7: Efficient use of loading bays

- Review loading bay restrictions in the inner-city.
- Restrict the use of loading bay during the peak hours.
- Limit the maximum duration for the use of the loading bay, depending on the number of businesses per loading bay, type of businesses in the area etc.
- Investigate the integration of the handheld parking meter system and the use of loading bays.
- Further investigate the concept of a website for scheduling the use of loading bays.
- Investigate the last mile solution as a part of the ITP freight strategy.

The project planning of the above strategies are shown in Table B.3.2-13.

Table B.3.2-13: Parking Implementation Projects

Strategy No	Strategy	Action	Implementation Date	Duration	Responsibility	2013/14	2014/15	2015/16	2016/17	2017/18
1	Parking Governance	Joint Parking Operations Committee Draft an MOU between CoT and parking garage operators	2013/14 2013/14	ongoing once-off	COT (Transport, Metro Police and City Planning) COT, Private sector					
2	Technology & parking supply	Parking guidance signs Provide guidance on off-street parking rates Use off-street parking as overflow lots of on-street parking	2013/14 2013/14 2013/14	ongoing ongoing ongoing	COT COT, Private sector COT					
3	Better Enforcement & zero tolerance	Appoint Trainee Metro Police Officers Appoint Metro Police Officers Purchase Tow Away Truck Investigate by-law on clamping Purchase Vehicle Clams Consider reducing marshal per bays; officer per marshals Implement paid on-street parking Expedite implementation of handheld meters	2014/15 2014/15 2015/16 2014/15 2014/15 2013/14 2013/14 2014/15	ongoing ongoing once-off once-off once-off ongoing ongoing ongoing	COT (Metro Police) COT (Metro Police) COT (Metro Police) COT (Metro Police) COT (Metro Police) COT (Metro Police) COT (Metro Police) COT (R&S)					
4	Parking is not Free	On-street parking to discourage long term parking Determine on-street and off-street rates in conjunction with PT availability Link handheld meters with UTC Sidewalks (rehabilitation) Prevent illegal parking (bollards & kerbs) Sec camera PTZ 180° at stations Sec camera PTZ 360° at stations Off street parking garage Integrate parking information with UTC	2014/15 2014/15 2014/15 2014/15 2014/15 2014/15 2014/15 2017/18 2014/15	ongoing ongoing ongoing ongoing ongoing once-off ongoing once-off once-off	COT COT COT COT (R&S) COT (Metro Police) COT (Metro Police) COT (Metro Police) COT (R&S) COT					
5	Infrastructure & Technology	Review off-street parking based on PT Feasibility study for shuttle service in CBD Identify and implement P&R Review loading bay restrictions in CBD Restrict loading activities to off-peak hours Limit maximum duration for loading activity based on business type Integrate handheld meters with loading bays Investigate website for scheduling use of loading bays Investigate last mile solution for freight	2014/15 2014/15 2015/16 2014/15 2014/15 2014/15 2014/15 2015/16 2016/17	ongoing once-off once-off once-off once-off once-off once-off once-off once-off	COT COT COT COT COT COT COT COT COT					
6	Public Transport Intervention									
7	Efficient use of Loading Bays									

The financial requirements relates to the cost estimates of the projects listed above, as well as the impact on the capital and/or operational budgets of responsible parties. Table B.3.2-14 summarizes the potential financial requirements over a three-year period of the operational plan for operational costs.

Table B.3.2-14: Financial Requirements over Three Year Period: Operational Budget

COST ITEM	2013/14	2014/15	2015/16
Law enforcement	0	R 416 000	R 552 000
Infrastructure	0	R 1 140 000	R 300 000
Management	R 300 000	0	0
Technology	0	0	0
TOTAL	R 300 000	R 1 556 000	R 852 000

Table B.3.2-15 summarizes the potential financial requirements over a three-year period of the operational plan for capital costs.

Table B.3.2-15: Financial Requirements over Three Year Period: Capital Budget

COST ITEM	2013/14	2014/15	2015/16
Law enforcement	0	R 10,000	R 810,000
Infrastructure	0	R 520,000	R 675,000
Management	0	0	0
Technology	R 3,341,518	0	0
TOTAL	R 3,341,518	R 530,000	R 1,485,000

It is, however, important to note that the capital costs required for technology have already being incurred as direction signs and power supply units have already been acquired. No additional cost is thus envisaged for the implementation of the short-term technology strategy.

B.3.2.5 Aviation

There are ten airports within Tshwane, however only one is owned by the City, namely Wonderboom Airport. See Figure B.3.2-17 and Table B.3.2-16 below for their locations and descriptions.

Figure B.3.2-17: Location of Airports within Tshwane

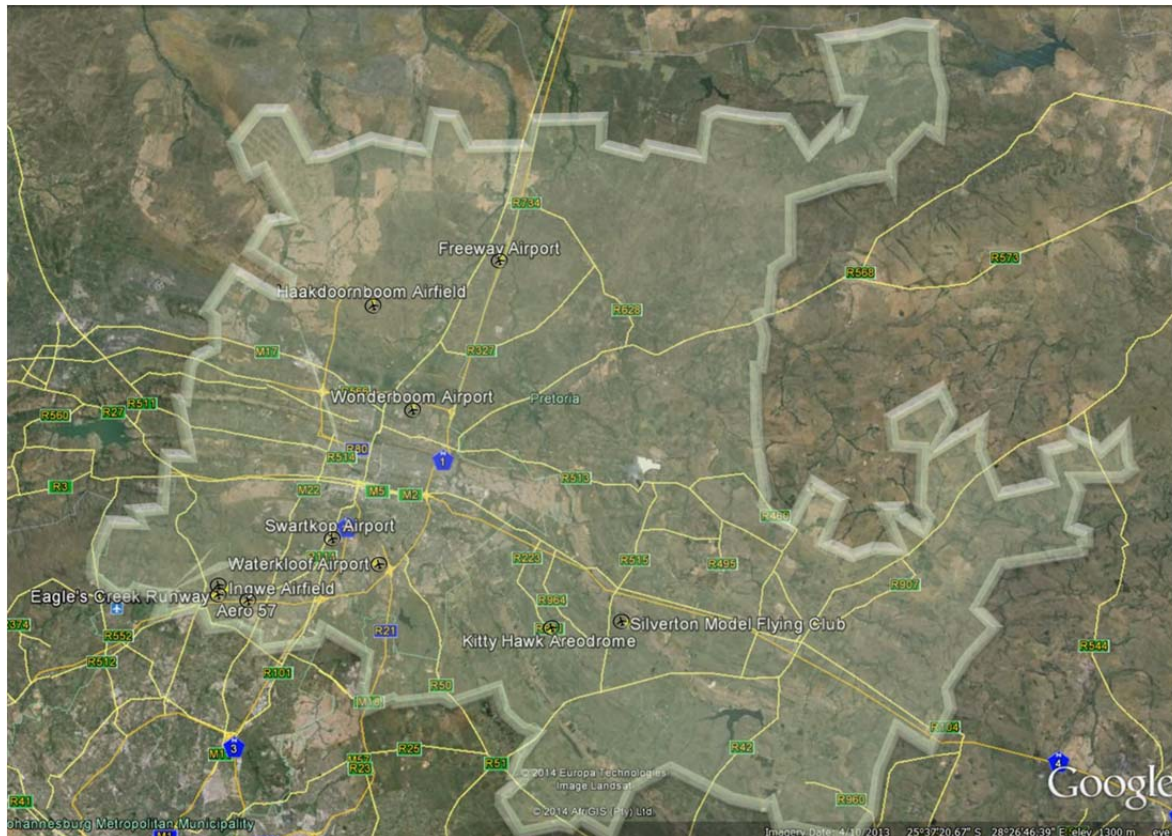


Table B.3.2-16: Summary of Airports in City of Tshwane

No	Name	Owner	ICAO name	Description
1	Wonderboom Airport	CoT	FAWB	Domestic GA airport
2	Waterkloof Military Air Force Base	RSA	FAWK	Military Air Force Base
3	Swartkop Military Air Force Base	RSA	FASK	Unlicensed Military Air Force Base, Airport Museum
4	Boschkop Aerodrome (Kitty Hawk)	Private	FAKT	Small airstrip, only GA with hangars for small private aircraft
5	Freeway Airfield	Private	FAFW	Small private grassed airstrip, no hangers provided

6	Haakdoornboom Airfield	Private	-	Small private grassed airstrip, no hangers provided
7	Ingwe	Private	-	No longer in use
8	Eagle's Creek Runway	Private	-	Very small airfield suitable for microlights
9	Aero 57	Private	-	Very small unregistered private airfield
10	Silverton Model Flying Club	Private	-	Very small airfield suitable for microlights

B.3.2.5.1 Region 2: Hammanskraal - Rainbow Junction

Located in the north of Tshwane, Wonderboom Airport is a domestic municipal owned airport which handles mainly general aviation and charter flight operations. Although it did initiate scheduled commercial flights in 2010 between Wonderboom and Cape Town, the commercial airline suspended flights after a short few months of operations due to bankruptcy. Wonderboom Airport continues to operate as a general aviation airport. Plans are in place to extend the runway and improve compliance requirements for both domestic and international chartered and scheduled flights. The physical characteristics of Wonderboom airport are as follows:

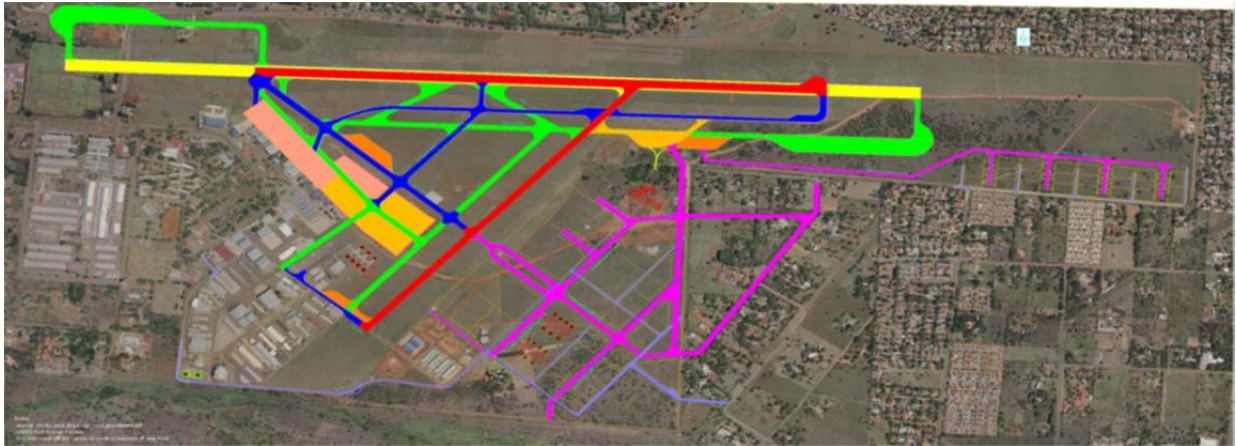
- Airport codes: FAWB; ²
- Type: Domestic airport (general aviation); ²
- Runways at Wonderboom Airport: ²
- 11L/29R – (1,825 x 30 m) — paved — lighted; and ²
- 06L/24R – (1,280 x 22 m) — paved ²

The following planning documents have been developed for Wonderboom: ²

- Wonderboom Airport Development Plan (2004), ²
- CoT Intergrated Transport Plan (2006-2011) ²
- Transport Policy Framework for the CoT (2008)

The Wonderboom Airport Development Plan (2004) focuses on the immediate upgrades required to accommodate domestic scheduled flights and private chartered domestic and international flights. The Development plan takes into account the airport expansion required to stimulate the local economy by complimenting the developments planned in the vicinity of the airport. ²See Figure B.3.2-18.

Figure B.3.2-18: Wonderboom Airport Development Plan



Source: Tshepaga, 2004

Since the Development Plan was completed in 2004, the Infrastructure Investment and Maintenance Program was developed in 2005 to guide the phasing of implementation of said Development Plan. Further, the EIA was completed and conditionally approved in 2007. An application for International Licensing was lodged in 2012 with the outcome still pending.

It is clear that this plan accommodates larger aircraft and more General Aviation traffic, facilitated by the following:

- lengthening the runway by a minimum of 600 m to serve Africa south of the equator, with aircraft such as a Boeing 737-800;
- enabling the introduction of scheduled domestic flights; constructing additional aircraft parking aprons and hangars; providing instrument landing facilities; improving the access control and security;
- upgrading the internal road, storm water, sewerage, water and electricity networks; upgrading the access from the N4 at the new Lavender Road interchange; and establishing a second access point to provide separate entrances for tenants and passengers, expanding and revamping the terminal buildings and parking facilities,
- identification of key commercial and industrial zones adjacent to the airport to facilitate economic growth in the area (potential Airport Maintenance Operators, Research & Development facilities, Healthcare facilities for specialised isolation).

The strategy for the Wonderboom Airport published in the City of Tshwane Integrated Transport Plan (2006 – 2011) outlines the City's intention to develop the airport for scheduled domestic flights as well international flights serving the SADC region.

The report provides findings of studies commissioned by CoT to establish the need for a third international airport in Gauteng and viability of international status for the Wonderboom Airport. The additional international airport in Gauteng will assist ORTIA and Lanseria in peak periods and the independence of its airspace from that of ORTIA and Lanseria further improves its suitability for international status.

The CoT Integrated Transport Plan also listed the following economic benefits to the CoT and Gauteng that can be expected to follow the international licensing of the airport:

- New business sales of between R0.5billion and R1.3billion; [2]
- New direct and indirect permanent employment of 5,000 – 11,000; [2]
- New salaries and wages of between R0.47billion and R1.1billion [2]
- An increase in the GDP of between R0.3billion and R1.0billion; [2]
- An increase in economic growth rates of Wonderboom, Tshwane and Gauteng; and [2]
- An increase in RSC levies income of between R2.5million and 6.5million [2]16.3.3 Transport Policy Framework for the City of Tshwane [2]The following Policy relevant to the Aviation Sector and Wonderboom Airport in particular where noted in this report: [2]
- ‘Air transport is recognised as an important mode of transport, and will be taken into account in future transport planning. Ensure that real economic conditions are taken into account with regard to the possible expansion/moving of Wonderboom Airport.’ [2]
- ‘Aligning land-use planning with transport planning and objectives. [2]Ensuring communications between affected departments within the Tshwane Metropolis to ensure integration of activities and planning. This communication is essential to ensure that prioritisation by one department is communicated to others which may be affected by such infrastructure supply.’ [2]The report further lists the decisions taken by the CoT, those of which pertaining directly to aviation are: [2]
- ‘The development of a freight logistics hub towards the north of the CoT will be continued.’ [2]
- ‘The role of Wonderboom Airport will receive specific impetus to attract flights to and from this destination, thus seeking to make the CoT a port of entry for international and local charter flights.’ [2]

B.3.2.5.2 Other Regions

A brief description of the other airports within CoT follows:

- Air Force Base Waterkloof is an airbase of the South African Air Force. It is situated on the outskirts of Pretoria, and is the SAAF's busiest airbase, and has recently had its runways and terminal upgraded. Although it can handle large aircraft, it is a military air force base, and hence is not used for civilian or commercial flight operations. The role of Waterkloof Air Force Base is to provide military air transport and other unique services in the interest of the South African Air Force with the various units and squadrons playing a supportive role in maintaining this task. It is also often used for official government use and Heads of State, and hosts an annual air show. There is no similar air force base in EMM. Only Military related development is supported in the vicinity of the Air force base. Commercialization of the airport will not be feasible since the underlying geotechnical condition (presence of Dolomite) is not conducive for this application. Furthermore the resistance from the existing residential stakeholders regarding expansion of the airport and the subsequent increase of airport related noise pollution will be a challenge to overcome during the EIA process.
- The Air Force Base Swartkop is no longer licensed and currently serves as a military museum and hosts various Air Shows. Any flights in or out are coordinated with the Waterkloof control tower since the two airports are located some 7km apart with overlapping flight paths. There are no plans for expansion or licensing of the airport.
- The Kitty Hawk Airstrip is privately owned and operated, located near Tierpoort. The airstrip is registered with the CAA as a non-instrument Code 1 paved runway. There are no plans for expansion as present and any future plans must be coordinated with the CoT, ATNS and the CAA.
- The Freeway Airstrip is privately owned and operated, located near Hammanskraal. The airstrip is registered with the CAA as a non-instrument Code 3 grassed runway. There are no plans for expansion as present and any future plans must be coordinated with the CoT, ATNS and the CAA.

In desktop study of the CoT extent, a number of unlicensed/unregistered landing strips were identified. At present the licensing and registration of an airfield in South Africa is a voluntary process, hence many privately owned landing strips are developed throughout the country without approval from the Aviation regulatory bodies. The CAA is currently in the process of licensing and registering all airports in the country in an effort to achieve safer air space conditions as the aviation industry grows and the airspace becomes progressively congested.

The following unlicensed/unregistered airfields were identified, however this list not exhaustive as there may be a number of unknown airstrips within the CoT, as advised by the CAA:

- Haakdoornboom Airfield
- Ingwe Airfield
- Eagle's Creek Runway
- Aero 57
- Silverton Model Flying Club

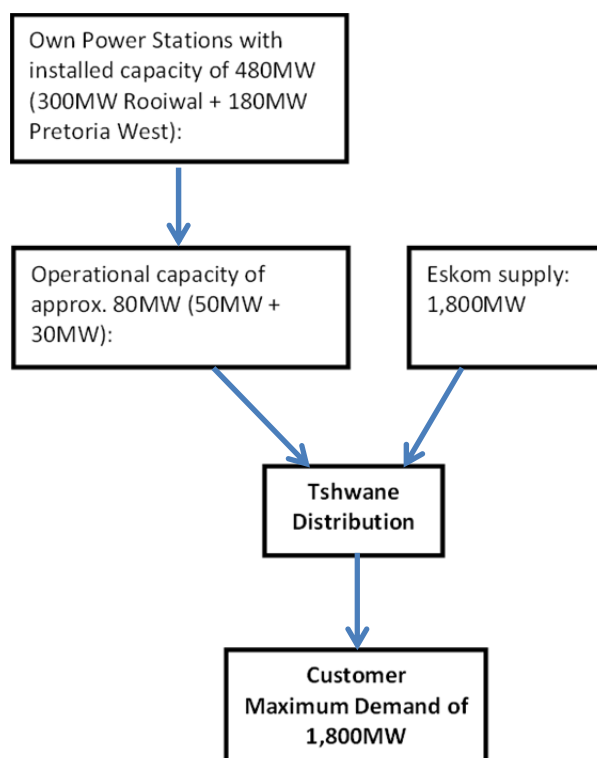
In formulating an airport strategy, it is also worthwhile taking into consideration the other larger airports in Gauteng that compete for air traffic (and airspace) with those airports and airfields in the province. It is beneficial to take into consideration the other larger in Gauteng that compete for airspace with those in the CoT whilst formulating the Airport Development Strategy. In particular, of interest to note is that one of the outcomes from NATMAP is that before 2050 Gauteng's largest airport (ORTIA) will have insufficient capacity to cater for the air transportation demands of the region, and that alternative strategies for a second major international airport would need to be considered for Gauteng. As the planning and construction of airport infrastructure can take several years (minimum for a Green-Fields development being approximately 5 to 6 years up to 20 years) it is important that conceptual planning for such a development commence in the very near future.

B.3.3 Energy and Electricity

B.3.3.1 Electricity Demand and Supply of the City

The current electricity supply structure for the Tshwane area is shown in Figure B-19.

Figure B-19: City of Tshwane Electricity Supply Status Quo



The City purchases the majority of its electricity requirement from Eskom at Eskom's published Megaflex tariffs.

B.3.3.2 The Power Stations

The Rooiwal power station is located within the rural area north of Tshwane. The station was built in the 1960's and is currently operating at far below the original design capacity of 300MW. The site has potential extension possibilities in several directions.

The efficiency of the Rooiwal power station, even when fully operational, is well below the norm for modern plant. Substantial investment, circa R 4 to 5 billion will be required to restore it to as close as possible to its original capacity.

The Pretoria West power station is located on a confined site without extension possibilities in Pretoria West. This station was first commissioned in the 1950's, with an even lower efficiency than the Rooiwal plant. Investment of circa R3 to R4 billion will be required to restore it to as close as possible to its original capacity.

The City has also embarked on a project to obtain third party involvement in the power stations, with private investors funding the refurbishing the power stations and to possibly construct a further new circa 300MW power station on the current Rooiwal site and to then operate and maintain the stations with the generated electrical energy being sold to the City on the basis of long

term Power Purchase Agreements. Implementation of the power station refurbishment will however still require the City to purchase the bulk of its electricity requirements from Eskom at various In-feed points into the City's network.

B.3.3.3 In-feed points from Eskom

An In-feed substation is a substation where CoT purchases bulk electricity from Eskom and distributes it on 132kV and 33kV infrastructure. Currently there are 11 In-feed substations covering the entire City of Tshwane Metropolitan Municipality and a portion of Madibeng Municipality (Hartebeespoort area).

Below is the list of CoT In-feed substations.

Table B.3.3-1: CoT In-feed Substations

In-feed Substation (IS)	Metering kV	Region	Firm Installed Capacity (MVA)	95% of FIC (MVA)	Backup (Reserve) (MVA)	Winter Load 2011 (MVA)	Winter Load 2012 (MVA)	Winter Load 2013 (MVA)	Winter Load 2014 (MVA)
Kwagga IS	275	3	900	855	300	901	875	755	906
Njala IS	275	6	750	713	250	702	789	842	707
Rietvlei IS	132	4	125	119	125	169	174	153	202
Buffel IS	132	1	40	40 (100% Loading)	Eskom	38	40	37	0
Hartebeespoort	88	Madibeng	40	38	Eskom	40	41	39	42
Tribor	132	7	60	57	Eskom	29	31	36	60
Refilwe	11	5	5.1	4.8	Eskom	3.1	3.2	3.4	3.4
Cullinan	6.6	5	5.1	4.8	Eskom	2.9	3.6	4.1	4.1
Rayton	11	5	5.1	4.8	Eskom	3.2	3.3	3.8	3.1
Hammanskraal	11	2	3.2	3	Eskom	1.8	1.9	2.2	2.2
Rethabiseng	22	7	2	1.9	Eskom	0.9	1.1	1.3	3.5
Total Load			1936	1839	675	1891	1963	1877	1933

It will be noted that the firm capacity of the In-feed points is already exceeded in a number of cases.

Njala, Kwagga, Rietvlei and Buffel In-feed substations are within the old CoT municipality (pre-merging with Nokeng and Kungwini) supply area and are on the 132kV network which is integrated to back up smaller In-feed substations like Rietvlei and Buffel. It takes a minimum of 24 months to construct an In-feed substation. Kungwini is supplied from Tribor In-feed substation at a Notified Maximum Demand (NMD) of 60MVA which is shared between two 132\11kV substations namely Ekandustria/Megger and Cathy/Bronkhorstspuit substations.

There are monthly meetings held between Eskom and Energy and Electricity Division (EED), to eradicate the loading status of In-feed substations and construction of the new Wildebees In-feed

substation as the solution for the whole city to deload the existing Kwagga (capacity of 900MVA), Njala (Capacity of 750MVA) In-feed substations and other 132kV overhead lines.

The current challenges with regard to the In-feed substations include the following:-

- Land/servitude matter for the construction of Wildebeest In-feed supply point from Eskom which needs to resolve. This matter has been with Eskom for approximately 5 years and will impact the whole of sub transmission In-feed network and will filter to capacity being allocated for new developments. Eskom mentioned that they have constraints in their network and based on their master plan they were going to be ready to provide additional capacity to the City by 2014, which later changed to 2016.
- Eskom is prolonging to furnish the City with budget quotations for the applications made by EED and not committing to delivery dates of other supply points.

B.3.3.4 The Primary distribution networks

The City distributes electricity throughout its supply area at 132kV, 88 kV and 33 kV networks. The network consists of high voltage overhead lines and, to lesser extent underground cables that supply electricity to a number of distribution substations where the voltage is stepped down from (mainly 132 kilovolt (kV) to 11 kilovolt).

The system consists of a total of approximately 450 km of high voltage overhead lines and cables and 66 step-down plus two switching stations. Most of the primary substations backlog was eradicated in the past six (6) years and most of the have adequate capacity. The infrastructures at most of the identified node within the City have been upgraded to cater for new developments.

The following powerline servitudes and substation sites must be acquired as they form part of the Masterplan alternatives, and the sooner it is acquired the cheaper the cost will be. The cost of acquisition of servitudes varies due to the cost of various areas across the City of Tshwane municipality. Three alternatives per servitudes will be investigated and most of the time servitudes with less affected land owners will be considered and EIA applications requires investigations on three alternatives for an application.

Table B.3.3-2: Primary distribution network acquisition planning

Power Line Name	Predecessor	Acquisition Date
Hartebeespoort power lines	Basic EIA	30-Jun-16
Highland - Scientia/Eland	Secondary section input on planning	30-Jun-16
Louwlerdia power line	Secondary section input on planning	30-Jun-16
K3 – Strydfontein	Basic EIA & Secondary section input on location	30-Jun-16
Strydfontein - Rama City	Basic EIA	30-Jun-16

Soshanguve - Sosh VV	Secondary section input on planning	30-Jun-16
Wilbebees - Mooiplaas	EIA- on going	30-Jun-16
Wilbebees – Tau	Basic EIA	30-Jun-18
Eland – Hatfield		30-Jun-17
Doornpoort T - Rodeplaat	Basic EIA	30-Jun-18
Rodeplaat - Tau	Basic EIA	30-Jun-19

B.3.3.5 Secondary networks

Electricity is distributed from the primary substations to 11 kV switching stations. The feeders are mostly underground cables. Local distribution is also by means of mostly underground 11 kV cables, which connects to local medium to low voltage distribution transformers from where residential and small consumers are supplied at the normal household voltage of 415V three phase or 240 V single phase through an extensive low voltage distribution network.

Larger consumers such as larger industries, large malls are supplied directly at 11 kV. In the case of new residential developments, the developer is required to not only provide the township internal medium and low voltage reticulation, but also the main feeders and switching stations.

Note: Detail to be provided by the electricity secondary planning: e.g. Status of networks per region, challenges, projects, etc.

The Hartebeespoort/Fortsig primary network is situated in the western part of City of Tshwane. The primary network supplies the area surrounding Hartebeespoort dam which includes developments such as Peacanwood, Ville de Afric, Meerhof, etc.

The Hartbeespoort network is a 33kV network, which operates on an island separate of the Tshwane network and has an Eskom connection at Hartbeespoort In-feed-station of 88/33kV with a firm capacity of 40MVA. The 33kV system operates on a radial ring system, which supplies the following substations (see picture below):

- Ifafi substation 30MVA capacity (firm 15MVA)
- Flora Park substation 5MVA capacity (unfirm)
- Swartspruit substation 5MVA capacity (unfirm)
- Broederstroom substation 15MVA capacity (firm)
- Gerotek substation 5MVA capacity (unfirm)
- Zilkaatsnek substation 5MVA capacity (unfirm)
- Schietfontein substation 5MVA capacity (unfirm)

- Yskor substation 1MVA capacity (unfirm)
- PMP substation 15MVA capacity (firm)

B.3.3.6 Drivers of development and electrical load growth.

Electrical load growth is driven by new township developments, new commercial and industrial developments, electrification programmes, township densification and growth in the demand of existing consumers.

Winter demand readings are taken on main substations and feeders, which serve to inform load-growth forecasts per suburb, substation, feeder, and regions. This together with new developments then serves as the basis for identifying projects per region.

B.3.3.7 Asset Register

A high-level asset register of the primary networks and the in-feed substations for the City of Tshwane is shown in Table B.3.3-3.

Table B.3.3-3: High-level Asset Register of Primary Networks and In-feed Substations

Items	Quantity
In-feed Points	10
Primary substations	66
132kV Switchyards	2
Generation Stations	2
Distribution transformers	260
In-feed 275\132kV transformers	10
Non-Firm Capacity (MVA)	7800
Firm Transformer Capacity (MVA)	6500
Non-Firm In-feed Transformer Capacity	2530
Firm In-feed Transformers Capacity (MVA)	1936
Non-Firm 132kV Line Capacity (MVA)	8728
Firm 132kV Line Capacity	4364
Power Lines 132kV (km)	304.5
Power lines 33kV (km)	112
Power Cables 132kV (km)	31

Note: Further detail to be provided by Energy and Electricity Department:

- **Assets per region**
- **Secondary network assets**
- **Asset values, age, condition etc.**

B.3.3.8 Summary of Network and Constraints

The following summary of network constraints is noteworthy:

- Electricity networks within the City of Tshwane are currently stable but most of the overhead lines are over loaded as they are on firm capacity (no back up). The City of Tshwane has a combination of 150MVA and 300MVA overhead lines which supplies power from the substations to the different parts in and around the City. Some of the 150MVA overhead lines are fully loaded and cannot transfer any more additional capacity out of the substations until CoT network has been upgraded.
- It is difficult to upgrade these lines due to the following reasons;
 - Additional servitudes are needed before new lines can be built.
 - The lines traverse over/between developed residential areas.
 - The lines cannot be switched off in order to do the upgrading.
- The in-feed stations will have capacity constraints in the next few years as they will be running without back up. Eskom must commit to the feasibility and budget quotations delivery dates.
- The City Centre 132kV cable has to be replaced as they are over their life span and might not be able to provide reliable supply.
- The underfunding, cut of funds and theft of electricity bulk infrastructure have a negative impact on service delivery and development and the loss in revenue.

B.3.3.9 Overview Of Bulk Electricity Infrastructure Projects

The projects relating to the bulk electrical infrastructure of the City should be completed:

- Compile and execute a 20-year master plan report of the 132kV sub transmission network in order to ensure capacity for future electrical developments.
- Compile and execute a feasibility report for the 132kV sub transmission network to ensure cost effective projects.
- Maintain and update network data to ensure effective Network Planning.
- Design the 275, 132, 33 kV sub transmission network to ensure compliance to set standards and specifications.
- Compile the tender document to be submitted to procurement for final approval and the appointing of a contractor to execute the project.

- Manage the execution of the project to ensure that the project adhere to all set standards and specifications.

B.3.3.10 In-feed Substations

In-feed substations are substations where CoT purchases bulk electricity from Eskom and distributes on 132kV and 33kV infrastructure. Currently there are 11 In-feed substations covering the entire City of Tshwane Metropolitan Municipality and a portion of Madibeng Municipality (Hartebeespoort area). The current capacity of the Tshwane In-feed substations are summarised in the following table.

Table B.3.3-4: Capacity of City of Tshwane In-feed Sub Stations

Firm Installed Capacity (MVA)	95% of FIC (MVA)	Backup (Reserve) (MVA)	Winter Load 2011 (MVA)	Winter Load 2012 (MVA)	Winter Load 2013 (MVA)	Winter Load 2014 (MVA)
1936	1839	675	1891	1963	1877	1933

The winter load on the Tshwane In-feed sub stations are equal to the current installed capacity. It takes a minimum of 24 months to construct an In-feed substation. There are monthly meetings held between Eskom and the City of Tshwane Energy and Electricity Division (EED), to eradicate the loading status of In-feed substations and construction of the new Wildebees In-feed substation as the solution for the whole city to deload the existing Kwagga (capacity of 900MVA), Njala (Capacity of 750MVA) In-feed substations and other 132kV overhead lines.

The current challenges include the following:

- Land/servitude matter for the construction of Wildebees In-feed supply point from Eskom which needs to resolve. This matter has been with Eskom for approximately 5 years and will impact the whole of sub transmission In-feed network and will filter to capacity being allocated for new developments. Eskom mentioned that they have constraints in their network and based on their master plan they were going to be ready to provide additional capacity to the City by 2014, which later changed to 2016.
- Eskom is prolonging to furnish the City with budget quotations for the applications made by EED and not committing to delivery dates of other supply points.

The current Eskom bulk electricity supply projects are summarised in Table B.3.3-5. The implementation of these projects is critical to ensure that the In-feed demand requirements can be met by bulk electricity supply.

Table B.3.3-5: Eskom Bulk Electricity projects which will benefit the City of Tshwane

NAME	START DATE	COMMISSIONING DATE	PROJECT COST	PROJECT DESCRIPTION
RIETVLEI	2011	Initial plan 2014 Revised plan 2016	R 55mil	Upgrade from 125MVA to 250MVA
WILDEBEES	2014	2019 (Preparing to go out on tender)	R 45 mil	To Build the new Wildebees 400/132kV 250MVA (firm, stage 1) In-feed substation by 2014 and finally to a firm capacity of 750MVA (future). 2 x 315MVA transformers have already been procured and they are installed and energized at Njala In-feed substation
BUFFEL	Recently received a feasibility quote from Eskom			In-feed to be built to supply 100MVA by 2016 and finally to 500MVA in future.
HARTEBEEPOORT	Eskom plans to provide 20MVA at 88kV for 2015			CoT applied for 190MVA in 2008, a) 50MVA at 88kV New, b) 40MVA at 33kV Increase, c) 100MVA at 132kV New
REFILWE	Refilwe 132/11kV In-feed substation to be constructed to accommodate 14MVA for the low cost housing project.			In-feed to be built to supply 40MVA by 2016 and finally to 120MVA in future.
RAYTON	Waiting for Feasibility quote from Eskom			Upgrade from 5.1MVA to 10MVA

B.3.3.11 Primary Substations (Upgrades and Reconfiguration) Regional Projects

Primary substations are substations that steps down the voltage from 132kV, 88kV or 33kV to 11kV, which is the distribution voltage. There are 68 primary substations in City of Tshwane and these are fed from the In-feed substation via 132kV overhead lines and underground cables. The average time taken from commencement to completion of primary projects is 3 years. This implies that projects to be completed in 2016/17 should have commenced during the 2014/15 financial year.

Most of the primary substations backlog was eradicated in the past six (6) years and most of the have adequate capacity. The electricity infrastructure at most of the identified nodes within the City have been upgraded to cater for new developments.

B.3.3.12 Region 1 Short and Medium Term Forecasting

The implementation of the bulk electricity and supply projects planned for Region 1 are listed in Table B.3.3-6. These projects will service the following nodes and areas:

- Industrial Hub
 - Upgrading of K3 132/11kV substation from 20MVA to 120MVA will cater for the future growth of the area e.g. Automotive Supply Park.
- Zone of Choice

- Orchards and Wolmer 132/11kV substations are situated in the identified Zone of Choice.
- Both substations will be upgraded from 35MVA to 120MVA.
- Soshanguve Node
 - K1 and K3 132/11kV substation are being upgraded to 60MVA and 120MVA respectively
 - New 40MVA K2 substation is constructed.
- Rama City
 - New Rama City substation is planned to be constructed to cater for Rama City development.
- Soshanguve Area
 - 70% of Soshanguve network was designed on a 33kV network and the 33kV network has limitations for transmitting bulk capacity of more than 100MVA therefore the 33kV network is no longer sufficient for the area. The network will be converted to 132kV to accommodate the growth of the areas and the 1st phase of the conversion has started.

Table B.3.3-6: Bulk Electricity Infrastructure current and future plans for Region 1

REGION 1 CURRENT PROJECTS							
NAME	START DATE	COMM. DATE	PROJECT COST	LOCALITY OF PROJECT	BENEFITTING WARDS	PROJECT DESCRIPTION	CURRENT STATUS
ORCHARDS	2010	2014	R 46 mil	4	4,98	Upgrade from 35MVA to 120MVA	100% to Completion
WOLMER	2010	2014	R 47 mil	98	2,96,98	Upgrade from 35MVA to 120MVA	100% to Completion
K2	2011	2014	R 56 mil	37	32,39,90	New 40MVA 132/11kV Substation	97% to Completion
K3	2011	2014	DoE (R68mil)	90	4,32,36,37,89	Install new 4 x 40MVA transformers at K3 substation. Dismantle the existing 2 x 20MVA transformers at K3 and install them at K1 substation.	97% to Completion
K1	2011	2014	DoE (R42mil)	90	36,39,89,90	Utilise the 2x20MVA transformers	97% to Completion

						from K3 and upgrade the substation from 20MVA to 60MVA.	
REGION 1 FUTURE PROJECTS							
NAME	START DATE	COMM. DATE	PROJECT COST	LOCALITY OF PROJECT	BENEFITTING WARDS	PROJECT DESCRIPTION	
JJ	2014	2016	R 55mil	14	14	New 120MVA 132/11kV Substation.	
STRYDFONTEIN	2017	2019	R 55mil	37	4, 30, 31, 32	New 80MVA 132/11kV Substation	
RAMA CITY	2022	2024	R 55mil	4	7,31,32,37	New 120MVA 132/11kV Substation	
SOSHANGUVE TO JJ 132KV LINE	2014	2016	R 83 mil	TSHWANE	TSHWANE	New 132kV power line	
BONNACORD SWITCHYARD	2020	2022	R 30 mil	96	2,49,50,90,98	New 132kV Switchyard	
L SUB	2016	2018	R 55mil			New 40MVA 132/11kV Substation. Change the existing 33kV to 132kV network.	
K SUB	2018	2020	R 55mil			New 40MVA 132/11kV Substation. Change the existing 33kV to 132kV network.	

The City is rolling out electrical connections to areas which current do not have electricity supply. These projects are listed below.

Table B.3.3-7: Electrification projects in Region 1

NAME	PROJECT COST	WARD	# OF CONNECTIONS
RAMA CITY	R 36.7 mil	4	2040
GARANKUWA X10	R 59.4mil	32	3300
SOSHANGUVE X19	R 45.4 mil	37	2523
SOSHANGUVE X20	R 36 mil	37	2000
KOPANONG X2	R 21.6 mil	20	1200

B.3.3.13 Region 2 Short and Medium Term Forecasting

The implementation of the bulk electricity and supply projects planned for Region 2 are listed in Table B.3.3-8. These projects will service the following nodes and areas:

- Hammanskraal BPO
 - It is situated within the Eskom licensed supply area.
- Zone of Choice

- Wonderboom and PTA North 132kV substations are situated in the identified Zone of Choice
- Wonderboom and PTA North 132kV substations have been upgraded from 35MVA to 105MVA
- PTA North will cater for the Rainbow Junction Development

Table B.3.3-8: Bulk Electricity Infrastructure current and future plans for Region 2

REGION 2 CURRENT PROJECTS							
NAME	STAR T DATE	COM M. DATE	PROJECT COST	LOCALITY OF PROJECT	BENEFITTING WARDS	PROJECT DESCRIPTION	CURRENT STATUS
WONDERBOOM	2011	2013	R 37 mil	50	2,5,54,96	Upgrade from 35MVA to 105MVA	100% Complete and handed over
PTA NORTH	2010	2012	R 41 mil	50	1,2,96,98	Upgrade from 35MVA to 105MVA	100% Complete and handed over
REGION 2 FUTURE PROJECTS							
NAME	STAR T DATE	COM M. DATE	PROJECT COST	LOCALITY OF PROJECT	BENEFITTING WARDS	PROJECT DESCRIPTION	
PYRAMID	2025	2027	R 40mil	96	49	Upgrade from 20MVA to 60MVA	

The City is rolling out electrical connections to areas which current do not have electricity supply. These projects are listed below.

Table B.3.3-9: Electrification projects in Region 2

NAME	PROJECT COST	WARD	# OF CONNECTIONS
HAMMANSKRAAL WEST X3	R 57.6 mil	76	3202
HAMMANSKRAAL WEST X4	R 55.3 mil	76	3021
TEMBA X1	R 4.5 mil	76	250

B.3.3.14 Region 3 Short and Medium Term Forecasting

The implementation of the bulk electricity and supply projects planned for Region 3 are listed in Table B.3.3-10. These projects will service the following nodes and areas:

- Hatfield Development
 - New Hatfield 132/11kV substation will be constructed to provide additional capacity to the existing and forecasted load.

- City Planning has already allocated the substation site and the 132kV cables routes will be determined.
- City Centre
 - Skinner, Princes Park and Boom Street 132/11kV substations have been well maintained and have adequate capacity for the growth.
 - The existing 132kV cables supplying the 3 substations have to be replaced as they reached their life span.
 - Salvokop Development will be fed from the existing city centre 132kV network

Table B.3.3-10: Bulk Electricity Infrastructure current and future plans for Region 3

REGION 3 CURRENT PROJECTS							
NAME	START DATE	COM M. DATE	PROJECT COST	LOCALITY OF PROJECT	BENEFITTING WARDS	PROJECT DESCRIPTION	CURRENT STATUS
GOMSAND	2011	2015	R 34 mil	55	1,2,7	Upgrade from 35MVA to 105MVA	88% to Completion
REGION 3 FUTURE PROJECTS							
NAME	STAR T DATE	COM M. DATE	PROJEC T COST	LOCALITY OF PROJECT	BENEFITTING WARDS	PROJECT DESCRIPTION	
HATFIELD	2018	2020	R 55mil	56	42,53,59,82,92	New 120MVA 132/11kV Substation	
WILLOWS	2027	2029	R 50 mil	86	43,85	To be refurbished	
TUNNEL	2015	2017	R 40 mil	58	1,55	Upgrade and extend the substation by adding the third transformer. Will keep the 100% back-up configuration.	
ZEBRA	2019	2021	R 50mil	3	7,51	Upgrade from 70MVA to 105MVA	
LOTUS	2020	2022	R 55mil	7	3,55,62,63	New 120MVA 132/11kV Substation	
MAYVILLE	2025	2027	R 50mil	1	2,53,54,58	Upgrade from 35MVA to 105MVA	
VILLERIA	2025	2027	R 50mil	53	52,54	Upgrade from 35MVA to 105MVA	
CAPITAL PARK	2025	2027	R 50mil	58	1,53,60,81	Upgrade from 70MVA to 105MVA	
BOOM	2027	2029	R 30mil	60	58,59,80	Replace 20 MVA transformers and protection	
ATTERIDGEVILLE	2025	2027	R 50mil	7	3,51,62,63	Upgrade from 70MVA to 105MVA	

SAULSVILLE	2025	2027	R 50mil	7	3,51,62,63	Upgrade from 70MVA to 105MVA
RIVER	2020	2022	R 60 mil	56	42,53,59,82,92	To be refurbished

The City is rolling out electrical connections to areas which current do not have electricity supply. These projects are listed below.

Table B.3.3-11: Electrification projects in Region 3

NAME	PROJECT COST	WARD	# OF CONNECTIONS
CLAREMONT	R 1.6 mil		90
DANVILLE ELANDSPOORT PHASE 2	R 36 mil		2000
DANVILLE INFILL SITE PHASE 1	R 7.2 mil		400

B.3.3.15 Region 4 Short and Medium Term Forecasting

The implementation of the bulk electricity and supply projects planned for Region 4 are listed in Table B.3.3-12. These projects will service the following nodes and areas:

- Centurion Aerospace
 - Waterkloof substation was upgraded to accommodate Aerospace's capacity requirements.

Table B.3.3-12: Bulk Electricity Infrastructure current and future plans for Region 4

REGION 4 CURRENT PROJECTS							
NAME	START DATE	COMM. DATE	PROJECT COST	LOCALITY OF PROJECT	BENEFITTING WARDS	PROJECT DESCRIPTION	CURRENT STATUS
CLAUDIUS	2009	2010	R 35 mil	61	7,48,66,70,71,72	Upgrade from 20MVA to 105MVA	100% Complete and handed over
DE HOEWES	2009	2011	R 30 mil	98	2,96,98	Upgrade from 35MVA to 120MVA	100% Complete and handed over
WATERKLOOF	2009	2011	R 18 mil	65	46,47,57	Upgrade from 40MVA to 60MVA	100% Complete and handed over
OLIEVENHOUTBOS CH132/11kV SUBSTATION	2008	2011	R 28 mil	48	64,70	Upgrade from 20 MVA to 60MVA	100% Complete and handed over
RIETVLEI 250MVA 400/132kV IN-FEED	2011	2014	R 55 mil	78	64,65,77,79	Upgrade from 125MVA to 250MVA	70% to completion

CORNWALL HILL	2011	2012	R 15 mil (for trfrs)	65	78,79,91	Upgrade from 40 MVA to 120MVA	100% Complete and handed over
REGION 4 FUTURE PROJECTS							
NAME	START DATE	COMM. DATE	PROJECT COST	LOCALITY OF PROJECT	BENEFITTING WARDS	PROJECT DESCRIPTION	
KLOOFSIG	2025	2027	R 40mil	57	66,79	Upgrade from 20MVA to 60MVA	
HENNOPS	2017	2019	R 55mil	78	64,65,77,79	New 120MVA 132/11kV Substation	
LOUWLARDIA	2017	2019	R 55mil	64	69,77,78	New 120MVA 132/11kV Substation	
BRAKFONTEIN-T SWITCHYARD	2015	2017	R 40 mil	77	70	New switchyard	
ELDORAIGNE	2014	2016	R 30 mil	78	57,65,69	Upgrade from 40 MVA to 60MVA	

The City is rolling out electrical connections to areas which current do not have electricity supply. These projects are listed below.

Table B.3.3-13: Electrification projects in Region 4

NAME	PROJECT COST	WARD	# OF CONNECTIONS
CLAREMONT	R 1.6 mil		90
DANVILLE ELANDSPOORT PHASE 2	R 36 mil		2000
DANVILLE INFILL SITE PHASE 1	R 7.2 mil		400

B.3.3.16 Region 5 and 6 Short and Medium Term Forecasting

The Electricity Infrastructure Planning department was still in the process of studying the existing infrastructure in region 5 and 6 at the time of writing of this report. Some of the alternatives that are being considered are the construction of a new In-feed station which will solve the capacity problems in that region. Most of the areas in this region are supplied by Eskom. The projects that have already been completed were the upgrading of the Rayton supply from 3.1MVA to 5.1 MVA. Electricity Infrastructure Planning and design section has also paid for the budget quote to upgrade capacity at Refilwe from 3MVA to 5MVA.

The implementation of the bulk electricity and supply projects planned for Region 5 and 6 are listed in Table B.3.3-14. These projects will service the following nodes and areas:

- Menlyn Node

- Highlands substation was upgraded to cater for the new development of Menlyn Main and the upgrade of Menlyn Mall.

Table B.3.3-14: Bulk Electricity Infrastructure current and future plans for Region 5 and 6

REGION 5 AND 6 CURRENT PROJECTS						
NAME	START DATE	COMM. DATE	PROJECT COST	LOCALITY OF PROJECT	BENEFITTING WARDS	PROJECT DESCRIPTION
HIGHLANDS	2010	2012	R 40 mil	45	45, 44 & 46	Upgrade from 70MVA to 105MVA
MOOIKLOOF	2008	2010	R 35mil	91	91	Upgrade from 35 to 105MVA
WAPADRAND	2008	2010	R 38mil	85	85 & 101	Upgrade from 35 to 105MVA
HEATHERLEY	2009	2011	R 48mil	86	86, 40 and 41	New 80MVA substation
REGION 5 AND 6 FUTURE PROJECTS						
NAME	START DATE	COMM. DATE	PROJECT COST	LOCALITY OF PROJECT	BENEFITTING WARDS	PROJECT DESCRIPTION
MOOIPLAAS	2017	2019	R 55mil	101	85,91,40	New 120MVA substation
MAMELODI III	2014	2014	R 50 mil	16	6,10,15,17, 18,23,40	Upgrade from 40MVA to 120MVA

The City is rolling out electrical connections to areas which current do not have electricity supply.

These projects are listed below.

Table B.3.3-15: Electrification projects in Region 5 and 6

NAME	PROJECT COST	WARD	# OF CONNECTIONS
REFILWE MANOR	R 17.6 mil	99/100	980
REFILWE X10	R 16.2 mil	99	900
DONKERHOEK	R 18 mil	99	1000
ELANDSHOEK	R 9 mil	100	500
REFILWE Ext 5	R 13 mil	100	700
DEWANDRIFT	R 18 mil	100	1000
KAMEELDRIFT	R 18 mil	100	1000
NELLMAPIUS EXT 24	R 48 mil	40	2700
NELLMAPIUS EXT 1	R 21.6 mil	40	1200
NELLMAPIUS EXT 6	R 1.9 mil	40	106
MAHUBE VALLEY EXT 2	R 2.8 mil	17	156
MAHUBE VALLEY EXT 15	R 37.8mil	99	2100
MAMELODI EXT 6	R 54 mil	40	3000
PIENAARSPORT	R 8.1 mil	99	450

REEFILWE X7	R 15.3 mil	99	850
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B.3.3.17 Region 7 Short and Medium Term Forecasting

The Electricity Infrastructure Planning department was still in the process of studying the existing infrastructure in region 7. Most of the areas in this region are supplied by Eskom while the City of Tshwane is supplying the rest. The projects that have already been completed were the upgrading of the Tribor capacity from 30MVA to 60 MVA and the upgrading of Rethabiseng capacity from 1MVA to 3 MVA.

The implementation of the bulk electricity and supply projects planned for Region 7 are listed in Table B.3.3-16.

Table B.3.3-16: Bulk Electricity Infrastructure current and future plans for Region 7

REGION 5 AND 6 CURRENT PROJECTS						
NAME	START DATE	COMM. DATE	PROJECT COST	LOCALITY OF PROJECT	BENEFITTING WARDS	PROJECT DESCRIPTION
CATHY	2013	2016	R 38 mil	102	100,103,105	Upgrade from 40MVA to 60 MVA

The City is rolling out electrical connections to areas which current do not have electricity supply.

These projects are listed below.

Table B.3.3-17: Electrification projects in Region 7

NAME	PROJECT COST	WARD	# OF CONNECTIONS
ZITHOBENI X8	R 15.5 mil	102	860
ZITHOBENI X9	R 7.1 mil	102	950

B.3.3.18 Madibeng Short And Medium Term Forecasting

The Hartebeespoort/Fortsig primary network is situated in the western part of City of Tshwane. The primary network supplies the area surrounding Hartebeespoort dam which includes developments such as Peacanwood, Ville de Afric, Meerhof, etc.

The Hartbeespoort network is a 33kV network which operates on an island separate of the Tshwane network and has an Eskom connection at Hartbeespoort In-feed-station of 88/33kV with a firm capacity of 40MVA. The 33kV system operates on a radial ring system which supplies the following substations:

- Ifafi substation 30MVA capacity (firm 15MVA)
- Flora Park substation 5MVA capacity (unfirm)
- Swartspruit substation 5MVA capacity (unfirm)

- Broederstroom substation 15MVA capacity (firm)
- Gerotek substation 5MVA capacity (unfirm)
- Zilkaatsnek substation 5MVA capacity (unfirm)
- Schietfontein substation 5MVA capacity (unfirm)
- Yskor substation 1MVA capacity (unfirm)
- PMP substation 15MVA capacity (firm)

The Hartebeespoort network is old and is operating at non-firm capacity at Hartebeespoort In-feed-station. The existing 33kV network was designed to supply rural areas. Subsequently the area has become an urban development, especially the areas surrounding the dam, which result in that the network is no longer sufficient on 33kV and needs to be upgraded to 88kV with the option to later convert to 132kV. The challenges that City of Tshwane is faced with are the capacity constraints from Eskom. Eskom indicated that CoT will only be able to get the requested capacity in 2016.

The implementation of the bulk electricity and supply projects planned for Madibeng are listed in Table B.3.3-18.

Table B.3.3-18: Bulk Electricity Infrastructure current and future plans for Madibeng

MADIBENG CURRENT PROJECTS					
NAME	Progress		CHALLENGES	LOCALITY OF PROJECT	PROJECT DESCRIPTION
CoT applied for 190MVA in 2008, a) 50MVA @ 88kV New, b) 40MVA at 33kV Increases, c) 100MVA at 132kV - New	Eskom to provide interim 20MVA @ 88 kV which is in process		CoT still waiting for feasibility quote from Eskom for other applications	MADIBENG	Upgrading of the Hartebeespoort network
MADIBENG FUTURE PROJECTS					
NAME	START DATE	COMM . DATE	PROJECT COST	LOCALITY OF PROJECT	PROJECT DESCRIPTION
SANDSPRUIT	2022	2024	R 30mil	MADIBENG	New 33/11kV 40MVA substation
CROCODILE	2027	2029	R 55 mil	MADIBENG	New 132/11kV 120MVA substation

B.3.3.19 Power Line, Servitudes and Primary Substation Sites

The following power line servitudes and substation sites must be acquired as they form part of the Master plan alternatives, and the sooner it is acquired the cheaper the cost will be. The cost of acquisition of servitudes varies due to the cost of various areas across the City of Tshwane

municipality. Three alternatives per servitudes will be investigated and most of the time servitudes with less affected land owners will be considered and EIA applications requires investigations on three alternatives for an application.

Table B.3.3-19: Power line, servitudes and primary substation sites

Power line name	Predecessor	Status/progress	Acquisition target date	Construction date
Hartebeespoort power lines	Basic EIA	Alternatives investigation	30-Jun-16	
Highland - Scientia/Eland	Secondary section input on planning	Alternatives investigation	30-Jun-16	
Louwlandia power line	Secondary section input on planning	Alternatives investigation	30-Jun-16	
K3 – Strydfontein	Basic EIA & Secondary section input on location	Alternatives investigation	30-Jun-16	
Strydfontein - Rama City	Basic EIA	Alternatives investigation	30-Jun-16	
Soshanguve - Sosh VV	Secondary section input on planning	Alternatives investigation	30-Jun-16	
Wilbebees - Mooiplaas	EIA- on going	EIA in process	30-Jun-16	
Wilbebees – Tau	Basic EIA	Alternatives investigation	30-Jun-18	
Eland – Hatfield		Alternatives investigation	30-Jun-17	
Doornpoort T - Rodeplaat	Basic EIA	Alternatives investigation	30-Jun-18	
Rodeplaat - Tau	Basic EIA	Alternatives investigation	30-Jun-19	

B.3.3.20 Summary of Electrical Infrastructure trends and demands

- Electricity network within the City of Tshwane is currently stable but most of the overhead lines are over loaded as they are on firm capacity (no back up). The City of Tshwane has a combination of 150MVA and 300MVA overhead lines which supplies power from the substations to the different parts in and around the City. Some of the 150MVA overhead lines are fully loaded and cannot transfer any more additional capacity out of the substations until CoT network has been upgraded.
- It is difficult to upgrade these lines due to the following reasons;
 - Additional servitudes are needed before new lines can be built.
 - The lines traverse over/between developed residential areas.
 - The lines cannot be switched off in order to do the upgrading.
- The In-feed stations will have capacity constrains in few years as they will be running without back up. Eskom must commit to the feasibility and budget quotations delivery dates.

- The City Centre 132kV cables have to be replaced as they are over their life span and might not be able to provide reliable supply.
- The underfunding, cut of funds and theft of electricity bulk infrastructure have a negative impact on service delivery and development and the loss in revenue.

B.3.3.21 Electrical Infrastructure asset register

An overview of the current electrical infrastructure assets of the City of Tshwane is provided in the following table.

Table B.3.3-20: Electrical Infrastructure Asset Register

Items	Quantity
In-feed Points	10
Primary substations	66
132kV Switchyards	2
Generation Stations	2
Distribution transformers	260
In-feed 275\132kV transformers	10
Non-Firm Capacity (MVA)	7800
Firm Transformer Capacity (MVA)	6500
Non-Firm In-feed Transformer Capacity	2530
Firm In-feed Transformers Capacity (MVA)	1936
Non-Firm 132kV Line Capacity (MVA)	8728
Firm 132kV Line Capacity	4364
Power Lines 132kV (km)	304.5
Power lines 33kV (km)	112
Power Cables 132kV (km)	31

B.3.4 Water and Sanitation

B.3.4.1 Current Water Sources and Demand

The City of Tshwane (CoT) currently has an average potable water demand of 987 MI/d. Rand Water Board supplies approximately 72% of the CoT demand from the Vaal River. Fountains, springs, boreholes and Water Treatment Plants (WTP) supply the remainder of the water demand of the city. The largest WTPs in Tshwane are Rietvlei WTP (40 MI/d), Roodeplaat WTP (60 MI/d), Bronkhorstspuit (54 MI/d) and Temba WTP (60 MI/d). Magalies Water Board (MW) also owns and operates three WTP's which supply CoT, namely Klipdrift WTP (18 MI/d), Wallmannsthal WTP (12 MI/d) and Cullinan WTP (16 MI/d).

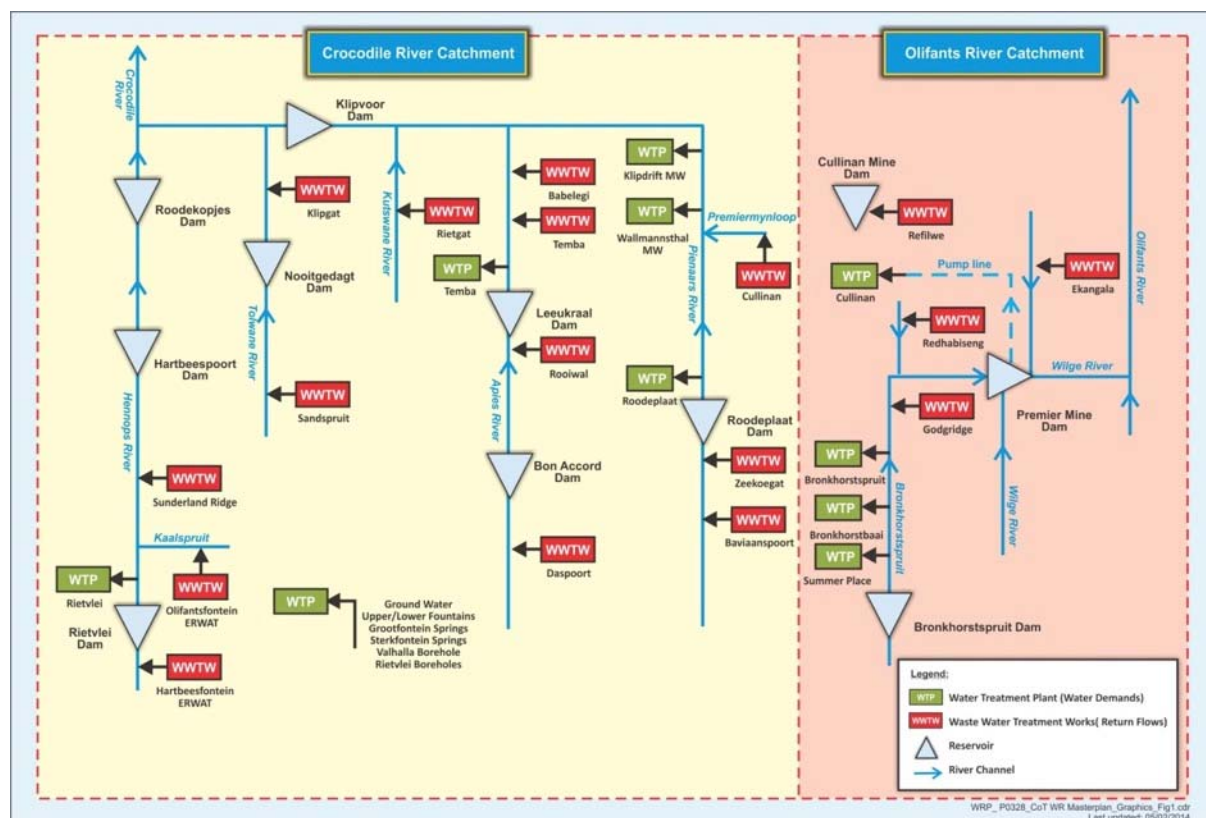
B.3.4.2 Current Waste Water Treatment Works and Sewer Flow

The CoT straddles the water divide between the Crocodile River basin in the west, and the Olifants River basin in the east. Approximately 505 ML/d is discharged into the rivers as purified effluent returns. Of this 96% or 485 ML/d ends up in the Crocodile River basin, and only 4% or 20 ML/d in the Olifants River basin.

The primary CoT Waste Water Treatment Works (WWTW) discharging in the Crocodile River basin are Sunderland Ridge (95 ML/d), Baviaanspoort (60 ML/d), Zeekoegat (30 ML/d), Daspoort (60 ML/d), Rooiwal (245 ML/d), Temba (12 ML/d), Rietgat (27 ML/d), Sandspruit (20 ML/d) and Klipgat (55 ML/d).

In addition, ERWAT's Olifantsfontein (105 ML/d) and Hartbeesfontein (45 ML/d) WWTW's also discharge Ekurhuleni's sewer flow into the Crocodile River basin upstream of CoT. The main CoT WWTW's discharging in the Olifants River basin are Cullinan (2 ML/d), Refilwe (2 ML/d), Rayton (1 ML/d), Godrich (5 ML/d) and two maturation pond systems serving Ekangala.

Figure B-20: Current Waste Water Treatment Works and Sewer Flow



B.3.4.3 Water Resource Situation

CoT finds itself in an interesting conundrum concerning its potable water resources. On the one hand the DWA's Vaal River Reconciliation study requires its main customers to reduce its growth in demand due to a shortage in yield of the Vaal River system, which will only be resolved by ±2021

when the second phase of the Lesotho Highlands Water Project (Polihale dam) is implemented. On the other hand, increases in CoT's sewer return flows into the Crocodile River basin are important from a perspective of generating sufficient yield to enable water supply to proposed Eskom coal fired power plants in Lephalale via the Mokolo Crocodile Water Augmentation Project (MCWAP). Developing or extending CoT's own water resources will reduce the import from and load on the Vaal River system, but will decrease the sewer return flows which are required for the Eskom/Lephalale supply.

The local water resource yields of the Crocodile River and Olifants River tributaries which are the sources of the main CoT and Magalies Water Board's WTP's are all very much dependant on the above sewer return flows (with Bronkhorstspuit WTP and Cullinan WTP being notable exceptions).

In the Olifants River basin all DWA allocated licences for water abstraction are already being exceeded, and water is imported from the Vaal River via a 30 Ml/d pumping scheme that delivers water into the Ekandustria reservoirs, for on-supply to Thembisile.

B.3.4.4 Future Water Demand and Sewer Flows

In accordance with the CoT current water and sewer Master Plan, which was based on the MSDF, the CoT potable water demand is set to increase over the next 40 to 50 years to 2600 Ml/d, with concomitant increase in sewer return flows to 1600 Ml/d.

The anticipated future water demands and sewer return flows will require a growth rate of $\pm 2\%$ p.a. (within CoT), which is not altogether unrealistic, given historical statistics. There are however a few very large areas where growth may or may not realise as anticipated. These needs may have a significant effect on sewer return flows and therefore the water resource availability at certain points in the Crocodile and Olifants River basins:

- R21 Corridor (extends into Ekurhuleni)
- Western Centurion
- East of Silver Lakes
- Doornpoort (north of Montana)
- Kameeldrift/Derdepoort area (southwest of Roodeplaat dam)
- Area southeast of Soshanguve
- South of Temba

B.3.4.5 Water Resource Availability and Options to Expand COT WTPs

The water resource analyses and analyses of CoT's WTP extension options area as follows:

- Rietvlei WTP can be extended over time from 40 MI/d to 140 MI/d
- With additional transfer flow from Olifantsfontein WWTW Rietvlei WTP can be extended from existing 40 MI/d to 240 MI/d over time
- Roodeplaat WTP can be extended from existing 60 MI/d to 240 MI/d over time
- Extension of Wallmannsthal WTP should not be considered in the light of the possible much larger extension of the Roodeplaat WTP
- There is sufficient water resource available to extend the Temba WTP from existing 60 MI/d to 180 MI/d (serving an AADD of 129 MI/d as required by the SDF based MP – which includes southern Moretele)
- There is no additional water resource available to extend the capacity of the 16 MI/d Cullinan WTP, and augmentation from other water resources (e.g. RW) will be required to serve the SDF based MP AADD of 38 MI/d)
- There is no additional water resource available to extend the capacity of the 54 MI/d Bronkhorstspuit WTP, and augmentation from other water resources (e.g. RW on top of existing 30 MI/d scheme) will be required to serve the SDF based MP AADD of 140 MI/d – which includes southern Thembisile)
- The required extension of the Bronkhorstbaai WTP to 5,5 MI/d capacity in order to serve the SDF based MP AADD of 4,2 MI/d for resorts around the dam is small enough to be accommodated and may be countered by slight additional augmentation into the Bronkhorstspuit/Ekangala system.

The Blue Drop Certification Program is an initiative of the Department of Water and Sanitation that provides the general public with reporting on the ability of the responsible authority to manage drinking water quality according to the risk management principles endorsed by the World Health Organisation (WHO). The Blue Drop Program performance for the City of Tshwane is shown in Table B.3.4-1.

Table B.3.4-1: Blue Drop Performance of City of Tshwane

	Supply Systems	2010	2011	2012
1	Central and South Tshwane	96.36%	97.22%	99.20 %
2	Tshwane CBD (Fountains)	96.36%	92.22%	97.02%
3	North Tshwane	96.36%	95.48%	96.88%
4	Temba	96.36	82.35%	93.50%
5	Nokeng	61.25	83.01%	90.75%
6	Bronkhorstspuit	41.25	81.24%	95.33%
7	Bronkhorstbaai	19.50	66.99%	78.07%
8	Summer Place	-	-	66.33%

Table B.3.4-2: Capex Requirements - Bulk Water (in R million)

Scheme	WTP capex	Bulk Water capex	Total capex	Total unit cost
	(R million)	(R million)	(R million)	(R/kl)
Rietvlei (without Olifantsfontein WWTW transfer)	R 719.5	R 137.8	R 857.3	R 3.38
Rietvlei (with Olifantsfontein WWTW transfer)	R 1 542.0	R 349.2	R 1 891.2	R 3.54
Roodeplaat	R 1 232.6	R 516.3	R 1 748.9	R 4.11
Temba WTP	R 946.1	n/a	n/a	n/a
RW Augmentation to Bronkhorstspuit	n/a	R 753.0	n/a	n/a
Bronkhorstbaai WTP	R 43.4	n/a	n/a	n/a

B.3.4.6 Waste Water Treatment Works Masterplan

The following extensions to the main WWTWs are foreseen in the sewer reticulation Master Plan:

- Crocodile River basin:
 - Sunderland Ridge WWTW (95 MI/d to be extended to 209 MI/d)
 - Schurveberg WWTW (proposed WWTW with 55 MI/d capacity)
 - Baviaanspoort WWTW (60 MI/d to be extended to 305 MI/d)
 - Zeekoegat WWTW (30 MI/d to be extended to 161 MI/d)
 - Daspoort WWTW (60 MI/d)
 - Rooiwal WWTW (245 MI/d to be extended to 492 MI/d)
 - Temba WWTW (12 MI/d to be extended to 33 MI/d + additional 87 MI/d)
 - Rietgat WWTW (27 MI/d to be extended to 119 MI/d)
 - Sandspruit WWTW (20 MI/d to be extended to 60 MI/d)
 - Klipgat WWTW (55 MI/d to be extended to 91 MI/d)

- ERWAT Olifantsfontein WWTW (105 MI/d to be extended to 157 MI/d)
- ERWAT Hartbeesfontein WWTW (45 MI/d)
- ERWAT Rietvlei WWTW (proposed WWTW with 193 MI/d capacity)
- Olifants River basin:
 - Lewzene WWTW (proposed with 11 MI/d capacity, replacing Cullinan and Refilwe WWTWs)
 - Rayton WWTW (1 MI/d to be extended to 12 MI/d)
 - Godrich WWTW (5 MI/d to be extended to 36 MI/d)
 - Ekangala WWTW (proposed with 20 MI/d capacity, replacing existing maturation ponds)

Capital investment in the Waste Water Treatment Works is also needed to meet statutory requirements in terms of the Licence conditions, as monitored in terms of the 'Green Drop' status of the plants. The City did an audit on upgrades required to meet the 'Green Drop' standards and has developed an investment program in this regard (refer to Table B.3.4-3).

Table B.3.4-3: Green Drop Status Planning and Targets

Green Drop Status Planning/Targets									
Assessment Period			2008 - 2009	2009 - 2010	2011 - 2012	2013 - 2014	2015 - 2016	2017 - 2018	2019 - 2020
Number	Wastewater Treatment Works	Region	2010 Report	2011 Report	2013 Report	2015 Report	2017 Report	2019 Report	2021 Report
1	Babelegi	2	No GD	No GD	No GD	No GD	Green Drop	Green Drop	Green Drop
2	Baviaanspoort	6	No GD	No GD	No GD	Green Drop	Green Drop	Green Drop	Green Drop
3	Daspoort	3	Green Drop	No GD	No GD	Green Drop	Green Drop	Green Drop	Green Drop
4	Ekangala	7	No GD	No GD	No GD	No GD	Green Drop	Green Drop	Green Drop
5	Godrich	7	No GD	No GD	No GD	No GD	No GD	Green Drop	Green Drop
6	Klipgat	1	No GD	No GD	No GD	No GD	No GD	Green Drop	Green Drop
7	Rayton	7	No GD	No GD	No GD	Green Drop	Green Drop	Green Drop	Green Drop
8	Refilwe	7	No GD	No GD	No GD	No GD	No GD	No GD	Decommissioned
9	Rethabiseng	7	No GD	No GD	No GD	No GD	Decommissioned		
10	Rietgat	1	No GD	No GD	No GD	No GD	No GD	No GD	Green Drop
11	Rooiwal East	2	No GD	No GD	No GD	No GD	Green Drop	Green Drop	Green Drop
12	Rooiwal North	2	No GD	No GD	No GD	No GD	No GD	Green Drop	Green Drop
13	Sandspruit	1	No GD	No GD	No GD	No GD	No GD	No GD	Green Drop
14	Summer Place	7	No GD	No GD	No GD	Green Drop	Green Drop	Green Drop	Green Drop
15	Sunderland Ridge	4	No GD	No GD	No GD	Green Drop	Green Drop	Green Drop	Green Drop
16	Temba	2	No GD	No GD	No GD	No GD	Green Drop	Green Drop	Green Drop
17	Zeekoegat	5	Green Drop	No GD	No GD	No GD	Green Drop	Green Drop	Green Drop
	Hennopsriver (New)	4						Green Drop	Green Drop
	Cullinan/Refilwe (New)	7						Green Drop	Green Drop
	Number of WWTWs		10	10	17	17	16	18	17
	Number of Green Drops		2	0	0	5	10	15	17

Table B.3.4-4: Capex Requirements: Bulk Sanitation (in R million)

Project Description	Cost	11/12	12/13	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21	21/22	22/23	23/24	24/25	25/26	26/27	27/28	28/29
General replacement and upgrade all works	244	21	10	10	13	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Sunderland Ridge WWTW (2) Add 30MI/d BNR, Sludge facility	35	34	0	1															
Sunderland Ridge WWTW (3) Add 30MI/d BNR	362						2	40	125	125	70								
Zeekoegat WWTW (1) 50MI/day BNR, Sludge facility	356	90	84	82	100														
Zeekoegat WWTW (2) add 40MI/day BNR	482										2	80	100	150	150				
Klipgat WWTW Restore 11 MI/d BTF, sludge facility, Anaerobic Digester refurbishment	49				10	39													
Klipgat WWTW Add 20MI/d BNR	240								1	9	40	100	90						
Rooiwal (East) WWTW Replace 55 MI/d BTF with 40MI/d BNR with external nitrification	482									2	80	100	150	150					
Rooiwal (North) WWTW Add 80MI/d BNR (1), Sludge facility extension	937	10	86	200	281	275	85												
Rooiwal (North) WWTW Add 50MI/d BNR (2)	590					1	20	100	180	180	109								
Rooiwal (North) WWTW Add 50MI/d BNR (3)	611													1	20	100	180	130	
New Hennops River WWTW 50MI/d BNR	612	1	11	15					10	75	200	200	100						
Baviaanspoort WWTW New 20MI/day BNR module (1), sludge facility, link outfall sewer	300			5	50	55	80	100	10										
Baviaanspoort WWTW Add 20MI/day BNR module (2)	260														5	50	80	80	45
Rietgat WWTW Re-commission unused 7MI/d BNR	2		1	1															
Rietgat WWTW Add 20MI/d BNR, Anaerobic Digestors, Sludge facility	248				1	7	60	100	80										
Upgrade existing Sandspruit WWTW for higher nutrient loading (Phase 1), Sludge facility	83		21	21	21	21													
Sandspruit WWTW (Phase 2) Add 10MI/d BNR	126						6	30	60	30									
Sandspruit WWTW (Phase 2) Add 10MI/d BNR	126																		
Upgrade existing Temba WWTW & PS (Phase 1) & Babelegi WWTW	285	62	108	54	60											6	30	60	30
Ekangala 10MI/day	74		45	14	15														
Godrich sludge facility new 10 MI/day BNR module	129			1	3	20	80	25											
Cullinan/Refilwe new 10MI/day module	110			1	9	40	50	10											
Total Budget	6 742	218	366	405	562	468	393	415	476	431	511	490	451	330	265	246	300	280	85

B.3.4.7 Water Conservation and Demand Management

The City of Tshwane has initiated a process to establish and implement a water demand management strategy with the following objectives:

- Quantifying the existing water loss and comparing with acceptable benchmarks. This process is updated on a monthly basis.
- Listing all the main water loss and water demand management aspects and rating the performance of City of Tshwane on every aspect.
- Providing recommendations with cost estimates on how the City of Tshwane can improve on every water loss and water demand management aspect.
- Prioritising the various WDM activities in order to optimise results, inter alia to meet targets as required by the Vaal River Reconciliation Steering Committee.

Table B.3.4-5: Summary of Tshwane Water Conservation and Water Demand Management Scorecard

Item No.	Description	Max Points	Score	Responsibility					
				W&S	Finance	Customer Care	Housing	Metro Police	Town Planning
1	Development of Standard Water Balance	4	4	✓	✓				
2	Pressurised Supply to all consumers 100% of time	4	4	✓					
3	Commercial and Industrial Metering System	4	4	✓	✓				
4	Residential Metering System	4	4	✓	✓		✓		
5	Effective Billing System including Informative Billing	4	3	✓	✓				
6	Network (Leakage) Complaints System	4	2	✓		✓			
7	Billing and Metering Complaints System	4	3	✓		✓			
8	Asset Register for Water Reticulation System	4	3	✓	✓				
9	Asset Management - Capital Works	4	3	✓	✓				
10	Asset Management - Operations and Maintenance	4	3	✓	✓				
11	Dedicated WDM support	4	3	✓					
12	Active Leakage Control	4	2	✓					
13	Effective Sectorisation	4	3	✓					
14	Effective Bulk Meter Management	4	3	✓					
15	Credit Control Policy and Implementation	4	2	✓	✓			✓	
16	Pressure Management and Maintenance of Pressure Reducing Valves	4	3	✓					

Item No.	Description	Max Points	Score	Responsibility					
				W&S	Finance	Customer Care	Housing	Metro Police	Town Planning
17	As-Built Drawings of Bulk and Reticulation Infrastructure	4	4	✓					
18	Schematic Layout of Water Infrastructure	4	4	✓					
19	Regulation of Water Fittings	4	2	✓			✓		✓
20	Implementation of By-Laws and National Standards or better	4	3	✓				✓	
21	Technical Support to Customers	4	2	✓	✓	✓			
22	Removal of Illegal Connections	4	2	✓	✓			✓	
23	Community Awareness and Education Programmes	4	2	✓					
24	Schools Awareness and Education Programmes	4	2	✓					
25	Newspaper & radio articles plus posters and leaflets for distribution	4	1	✓					
	Totals	100	71	-	-	-	-	-	

Many of the items in the scorecard have a direct impact on water losses, whilst some of them are enablers that assist in reducing the water losses. Others, such as education and awareness are long-term projects that will not have any immediate effect on the reduction of the water losses. The items below specifically target water losses and have therefore been highlighted.

ITEM 3: COMMERCIAL AND INDUSTRIAL METERING SYSTEM

Introduction

All water utilities must aim to properly meter and bill all large water users (i.e. Industrial, commercial, municipal and government buildings). In addition, all fire hydrants and secondary fire connections at these properties should also be metered to ensure that water is not being used for other purposes through the fire connections.

Situation in City of Tshwane

Most large consumers in the City of Tshwane are properly metered and billed. There may still be fire systems inside some older buildings which are not metered.

More than 3300 of these connections have been audited in 19 areas - and since the audits the metering problems identified have been corrected. The purpose of these audits was to identify and correct any shortcomings with regards to metering and billing (i.e. un-metered connections, un-metered fire connections, malfunctioning meters, illegible meters, un-billed meters etc.)

Similar meter audits are currently undertaken for the Top 200 consumers in CoT which are not located in industrial/commercial areas (i.e. shopping centres, government complexes etc.)

Recommendations and Strategy

CoT should continue with the exercise to audit the Top 200 consumers and subsequently to correct all metering and billing problems identified with these consumers.

CoT should commence with an audit of large residential estates supplied via bulk metering.

Funding and Budget Requirements

R2.5 million per year for a period of 5 years.

ITEM 4: RESIDENTIAL METERING SYSTEM

Introduction

In addition to metering large water users, water utilities must also aim to properly meter and bill all residential consumers. It is important that the systems be in place to undertake monthly meter reading and billing with the necessary back-up customer complaint services.

Situation in City of Tshwane

All formal residential areas in the City of Tshwane are properly metered and billed. Large volumes of meters are replaced annually as part of the meter replacement program. A summary of the meter replacements over the last few years is shown below:

Year	Number of Consumer meter replacements per year	Number of Consumer meter replacements per day
08/09	32 416	89
09/10	59031	162
10/11	44 669	122
11/12	50 552	138
12/13	67 422	184

The City of Tshwane continuously undertakes meter audits at residential stands throughout the city.

One of the ongoing problems with metering of residential consumers in the City of Tshwane is that the information on new meter connections for housing projects initiated by the local and provincial Departments of Housing are not provided to the Water and Sanitation Division. The vast majority of these (if not all) developments are on un-proclaimed land which exacerbates the problem. The service delivery coordinator has established a committee in 2012 to examine, quantify and resolve these issues. It is estimated that approximately 20 000 of these new houses in Tshwane are not yet metered, this includes properties inherited from the Regions 5, 6 and 7.

Water consumption at informal areas is not measured through individual household meters but rather through bulk meters supplying the whole informal area. For some informal areas with multiple unknown water supply points the water consumption is estimated using the same area to water consumption ratio as obtained from similar informal areas that are metered.

Recommendations and Strategy

Auditing should continue in all residential areas with metering and billing problems.

Improved communication is required between the local and provincial Departments of Housing and the Water and Sanitation Department of the city.

The target for CoT should be to have 100% meter coverage within the next 5 years.

This will include metering the estimated 20 000 new un-metered houses that were constructed as part of Department of Housing Projects.

Funding and Budget Requirements

The estimated 20 000 un-metered houses that were constructed as part of Department of Housing Projects should be metered over the next 5 years. (Approximately R1000 for a new meter installation). A challenge currently being experienced is that residents in these areas are not permitting contractors to install water meters.

The auditing of areas with metering and billing problems should be undertaken continuously with an estimated budget of R1 million/annum.

All shortcomings identified during the audits should be rectified as a priority (meter installations and updating of billing system) at an estimated cost of R4 million/annum.

ITEM 6: NETWORK (LEAKAGE) COMPLAINTS SYSTEM

Introduction

In order to repair reported leaks quickly and effectively it is necessary to have an efficient leakage reporting system in place. Ideally, such a system should be toll-free and a single number should be used to avoid confusion. Residents should be encouraged to report any leaks they find. This is one of the key elements of an efficient WC/WDM strategy since most leaks repaired in South Africa result from such Passive Leakage Control and not Active Leakage Control.

Situation in City of Tshwane

The City of Tshwane has a single Customer Care Centre for the whole city. The current toll free phone number is (012) 358 9999.

A comprehensive leak repair system is currently in place, which keeps track of all leak repairs and repair times. The target of the leak repair system is to repair 75% of all leaks reported within 48 hours. The current percentage of leaks repaired within 48 hours has lately dropped from 80% to 70% - mainly as a result of under-staffing and lack of sufficient vehicles. A summary of the leaks repaired over the last few years in CoT is shown below:

Year	Number of Leaks repaired per annum (mostly Passive Leak Reporting)	Number of Leaks repaired per day
08/09	31 871	87
09/10	32 758	90
10/11	36 049	99
11/12	39 979	109
12/13	43 493	119

Recommendations and Strategy

The target of the leak repair system can be improved to repair 90% to 95% of all leaks reported within 48 hours. A current shortage of staff is restricting the leak repair system to perform even more efficiently.

The option to handle all water and sanitation communications and work planning in a centralised Water Division control room should be considered. The existing communication systems could be

joined with the work planning, which needs control room administration and technical people to plan every job reported in a correct sequence. Issues to take into account in planning job sequence should include: size of job, age of job, type of job suitable for each team, correct manning numbers and effective route planning. Effective job planning will reduce ineffective travelling and avoid unnecessary overstaffing of teams.

Additional Funding and Budget Requirements

Additional staff and vehicles will be required if the leak repair times are to be improved. It is estimated that an additional budget of R3 million per annum needs to be allocated.

ITEM 7: BILLING AND METERING COMPLAINTS SYSTEM

Introduction

In addition to the system designed to address physical leakage, another system is also required to deal with billing and metering complaints. Such a system is required to ensure that customers can pay their water accounts with confidence and that any problems experienced are dealt with quickly and effectively.

Situation in City of Tshwane

As mentioned previously the City of Tshwane has recently established a single Customer Care Centre for the whole city. The current toll free phone number is (012) 358 9999.

The Customer Care Centre forwards billing problems to the Finance Department. The Finance Department will address billing problems where possible and if it is established that there is a meter problem a request for meter checking or replacement will be forwarded to the Water & Sanitation Division. The time to deal with these complaints can vary between a few days to several months for some consumers.

It is recognised that the metering problems of some consumers cannot be effectively dealt with via the route of the Customer Care Centre. For this reason the Water & Sanitation Division has established a central administration office that deals with abnormal metering complaints and problems. This office is situated in the Capitol Towers North Building.

The target for the Water & Sanitation Division to deal with metering problems is 14 days.

Currently 90% of all metering complaints are dealt with in 14 days with an average duration of 12 days in the SAP area. The time to deal with billing related problems will depend on the complexity of

the query.

Recommendations and Strategy

The W&S Division should aim to maintain the current reaction times for metering complaints, which will only be possible if experienced and competent staff is retained and if sufficient funding can be made available.

It should be noted that constraints for achieving the target includes: meter reading inefficiencies, meter shortages, access problems to erven and wrong addresses shown on billing systems.

Additional Funding and Budget Requirements

It is estimated that R2 million/yr is required to run the Central Administration Office (Back Office) that is dealing with abnormal metering problems.

ITEM 9: ASSET MANAGEMENT – CAPITAL WORKS

Introduction

Replacements of water networks and other dilapidated infrastructure that reached the end of their economic life is a prerequisite for reducing physical water leaks. Sustaining of the water infrastructure through replacements will ensure long term optimisation of water supply services and protection of revenue and service delivery standards.

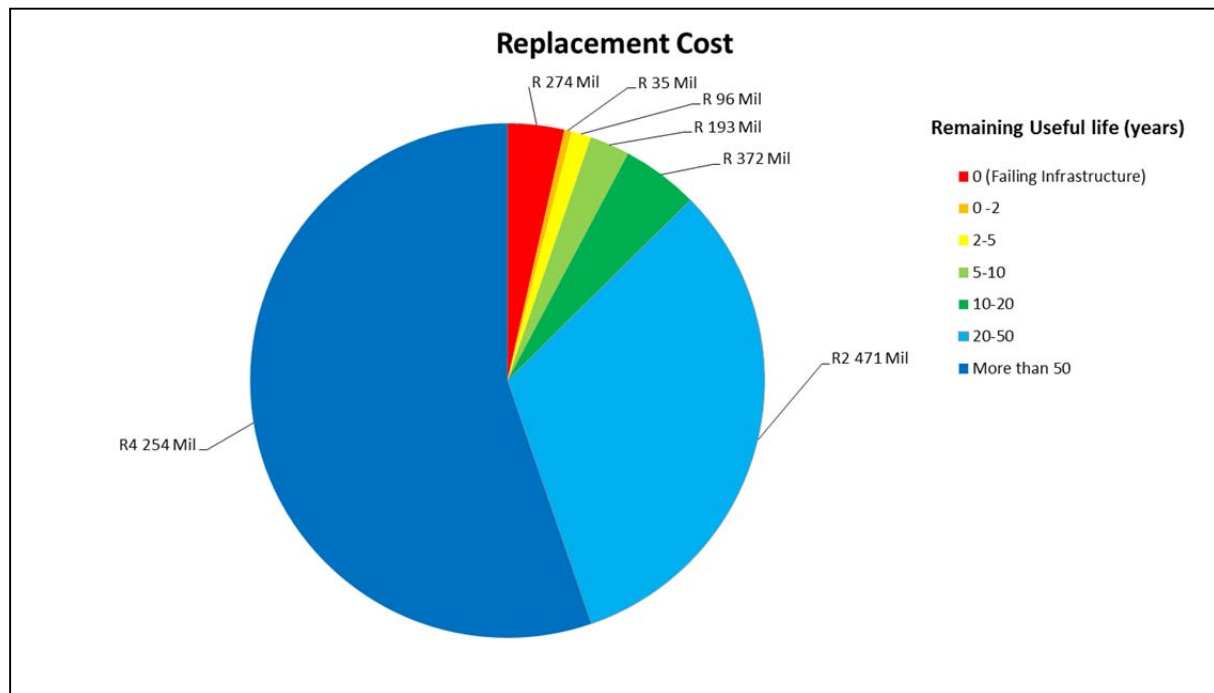
Situation in City of Tshwane

Trends in pipe bursting have shown an increase over the last years, which are placing a large challenge on maintenance resources and inconvenience to consumers. The City therefore developed a scientific pipe replacement model in order to optimise funding requirements and other scarce resources.

A Pipe Replacement Priority Model was developed and assesses two key indices – the likelihood of failure and consequence of failure. These two indices are assessed for each pipe by an index value within a range of 1 to 5. Various independent factors contribute to each of these indices.

In summary, the replacement cost in terms of the remaining useful life of all water pipes, totalling 10,500 km in length, is per chart below.

Figure B-21: Water pipes - Remaining useful life (years)



Recommendations and Strategy

Redundant pipes to be replaced immediately (red) and which will become redundant with the next 5 years (orange and yellow) totals R407m. Spread over 5 years will thus require R80m per year to cover the backlogs and catch up with the immediate needs.

Additional Funding and Budget Requirements

It is calculated that R80 million/annum is needed to replace redundant pipelines and thus reduce water bursts and water losses to acceptable levels within the City.

ITEM 12: ACTIVE LEAKAGE CONTROL

Introduction

Active Leakage Control involves sending teams out to search for unreported leaks as opposed to Passive Leakage Control which involves waiting on residents to report leaks which are then repaired. The most basic and often most cost effective approach to Active Leakage Control is to send in teams to walk along the path of every water transmission main in the system.

Situation in City of Tshwane

Unreported leaks in the City of Tshwane are usually more common in areas with high water losses

(such as Atteridgeville, Mamelodi and Soshanguve).

In 2007 and 2008 pilot projects were undertaken in the dolomite region (Valhalla and Laudium) to assess the potential for identifying unreported leaks through Active Leakage Control. In Valhalla 5 visible leaks and 0 non-visible leaks were located out of approximately 80km of pipes and in Laudium 26 visible leaks and 5 non-visible leaks were located out of approximately 70km of pipes. The results indicated that the effort and expense was not justified by the number and sizes of leaks found.

Subsequently a different approach has been followed that focus purely on visual leak detection and visual metering problems in high leakage areas. Between 2010 and 2013 such exercises were undertaken in Atteridgeville, Nelmapius and Soshanguve. The results below show that with a relatively low budget and in short time periods a large number of leaks and metering problems were identified.

It is recommended that Tshwane should undertake such investigations on an annual basis in all low cost housing areas that are known for visual leaks and consumer meter tampering/ vandalism.

Area	Pipe Length (km)	Cost (R)	Leaks Identified	Consumer meter problems identified (excl leaks @ meters)
Atteridgeville West	74	R 48 000	33	21
Atteridgeville Central	42	R 48 000	79	29
Atteridgeville East	105	R 200 000	389	176
Nelmapius Ext 6,7,8	27	R 8 000	13	No meters installed to date
Soshanguve L & surrounding ext.	137	R 200 000	211	86

Recommendations and Strategy

The City of Tshwane should initiate an ongoing visual leak detection program in areas such as Mamelodi, Atteridgeville and Soshanguve.

Active Leakage control for medium and high income areas should only be considered if leakage is suspected to be high or if the risk of leakage is high (as for instance in dolomitic areas).

Funding and Budget Requirements

It is estimated that the Active Leakage Control activities will require a budget of R500 000/annum.

ITEM 14: EFFICIENT BULK MANAGEMENT METERING SYSTEM

Introduction

Bulk meters are typically used on the inlet of reservoirs or on the inlet of direct supply zones. These meters are used to verify the volume of water supplied from the Rand Water and Tshwane owned purifications plants.

Situation in City of Tshwane

A comprehensive bulk metering system is already in place.

Most reservoir zones have been logged in 2011/12 to determine the minimum night flows. In addition some GSM loggers are currently used and the data is displayed on a web based system.

Recommendations and Strategy

All bulk management meters should be checked annually and replaced on a 5 year cycle with a newly calibrated meter mechanism.

Approximately 20 new bulk management meters are currently required by the City of Tshwane.

Funding and Budget Requirements

A new complete bulk meter installation will cost approximately R250 000 and a total budget of approximately R5 million is required for the 20 new meter installations.

A further R1.5 million/yr is required to replace malfunctioning or damaged bulk meters.

ITEM 15: CREDIT CONTROL POLICY AND IMPLEMENTATION

Introduction

All water utilities should have a policy and strategy on how to manage the water consumption for payment defaulters and indigent users.

Situation in City of Tshwane

Currently the credit control strategy of the City of Tshwane consist of a 3 staged plan. To date Step 1 and 2 of the credit control strategy has been implemented. Step 3 has not been implemented to

date and is currently being evaluated.

	STEP 1	STEP 2	STEP 3
Consumer Profile	First credit control action against consumers who are in arrears with their account Action Type : WR-1	Consumers not paying for water or tampering with device and/or installation. Action Type : WR-2	Further tampering or interference with the device and/or installation Action Type : WR-3
Conventional Consumers	Limit supply with an intelligent flow regulator. Set at 2 litre/minute. Secure device with appropriate security device.	Limit supply with an intelligent flow regulator. Set at 1 litre/minute. Secure device with appropriate security device. Install a device that will provide the necessary evidence for prosecution if tampers again.	Limit the water supply with a volumetric dispenser.
Indigent Consumers	Limit the water supply with a volumetric dispenser. Free water of 400litre/day (12kl/month)		

Legal action can be considered at any stage in the process if payment defaulters tamper with the flow regulator or the volumetric dispenser.

Recommendations and Strategy

Flow regulators should be installed for all payment defaulters that are on Step1 and Step2.

There are currently \pm 5000 payment defaulters. Step 3 for conventional consumers (Volumetric flow dispensers) will be considered if the consumer tampers with the device in Step 2 or if no payment for water is received.

Funding and Budget Requirements

The estimated budget for the installation of flow regulators (Step 1 + 2) for payment defaulters is R12.0 million / year.

Should Step 3 in the Credit Control process be implemented the estimated budget for supply, installation and maintaining volumetric dispensers is R10.0 million/year.

ITEM 16: PRESSURE MANAGEMENT

Introduction

Pressure management is one of the key WDM interventions that can be used to reduce leakage and extend the life of the reticulation system in areas which experience high leakage. The basic principle is that any reduction in pressure will result in a reduction of leakage. Pressure Reducing Valves (PRV's) are used to reduce the pressure in a pipeline to a lower constant outlet pressure. In certain

cases it is also feasible to install a smart pressure controller onto the PRV which will allow further pressure reduction during off-peak periods.

It is not always possible to implement pressure management in an area especially in hilly areas where high water pressures are sometimes need to push the water over the hills into adjacent areas. If pressure management can be implemented, it can often have spectacular pay-back periods of several months and can be used to reduce not only the system leakage but any gross wastage by consumers who may not be paying for water.

Situation in City of Tshwane

There are currently approximately 438 control valves in CoT (PRV's, Level Control Valves, Flow Control Valves, Pump Control and Pressure Relief Valves).

Smart pressure controllers have been installed on approximately 10 PRV's. Documented results are available on the savings achieved through the implementation of these pressure controllers in Tshwane. Results obtained through at installations are summarised in Section 7.

A private contractor appointed by the City of Tshwane maintains all control valves on a regular basis. Very high pressures (sometimes in excess of 100m) still exist in some remaining areas of the City of Tshwane.

Recommendations and Strategy

Complete the construction of PRV chambers that have already been designed/planned.

Remaining areas with high levels of leakage and/or high incidences of pipe bursts should be identified and investigated to establish the potential for pressure management.

It is recommended that the downstream pressures of all PRV's be logged every 12 to 24 months.

Funding and Budget Requirements

A budget of R10 million per annum should be allocated to pressure management studies and implementation where the efforts are directed to known problem areas.

An annual budget of approximately R350 000 should be allocated for the logging and interpretation of the logging results on all PRV's.

ITEM 22: REMOVE ILLEGAL/UN-AUTHORISED CONNECTIONS

Introduction

Illegal or un-authorised water connections are a serious problem in South Africa and one with which very few municipalities can deal with effectively. Un-authorised connections directly impacts on the NRW and also can negatively impact on the operation of the system if too many illegal connections are made in one area.

Situation in City of Tshwane

The City of Tshwane has a formal policy and strategy regarding the removal of illegal connections. The municipality removes illegal connections on an ad-hoc basis but does not have sufficient capacity to address the problem throughout the city.

It is estimated that there are between 13 000 and 21 000 illegal or un-authorised water connections in City of Tshwane. This is based on an estimate of 3% to 5% of the total number of consumer meters.

Recommendations and Strategy

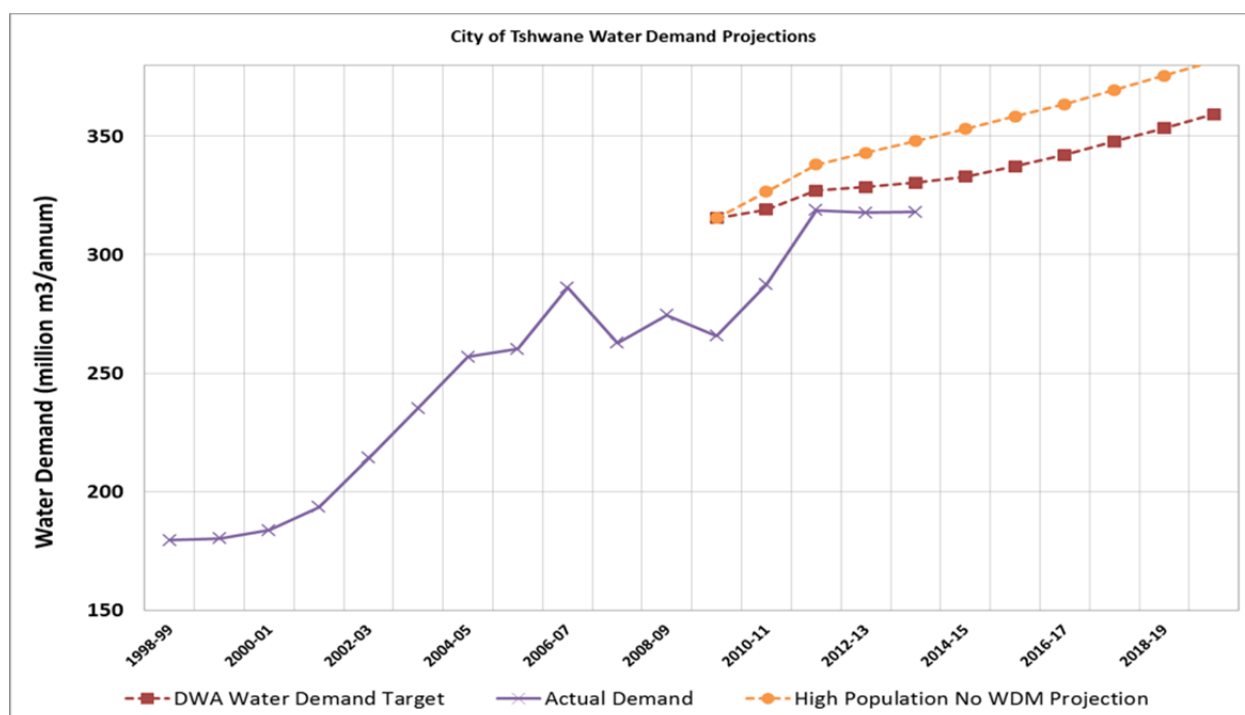
The City of Tshwane should appoint additional dedicated staff that can detect and remove illegal connections and prosecute the offenders.

Funding and Budget Requirements

It is estimated that R2 million/annum should be allocated for additional staff that can detect and remove illegal connections and prosecute offenders.

The City is actively engaged in managing its water demands and losses in order to meet the DWS 15% demand reduction target aimed at reducing water demands in the Vaal River System, as indicated in the graph below. This is, however, an on-going project that will require funding for operations and renewal of infrastructure to maintain.

Figure B-22: City of Tshwane Water Demand Projections



B.3.4.8 Backlog Eradication of Water and Sanitation Networks

B.3.4.8.1 Formalised areas

The City is implementing Service Backlog Eradication Projects in the formalisable settlements of Ramotse, Marokolong, Kudube, Suurman, Mashemong, Majaneng, Stinkwater, New Eersterust, Tswaing and Ekangala (Refer to Table B.3.4-6). These areas are already supplied with a basic water service. Upgrade to full service metered water connections per stand is scheduled before the installation of waterborne sanitation. Some progress has been made with this phase.

Bulk water and sanitation infrastructure projects precede the reticulation components. Temba Waste Water Treatment Works and Temba Water purification Plant upgrades are part of such components as is the Babelegi Reservoir.

Table B.3.4-6: List of Bulk Water and Sanitation Service Backlog Eradication Projects

Sanitation							
IDP project number	Area	Wards	No of house-holds	Current Service levels	Target service level	Construction period	
			59492			Start	Finish
710878	Ramotse-Marokolong,	73	22000	Below basic	Full	07/2006	06/2019
710878S	Kudube 8	74	1400	Below basic	Full	07/2016	06/2018
710878K	Kudube 5	75	1600	Below basic	Full	07/2014	06/2016
710878EK	Ekangala Block A & F	13, 95	7500	Below basic	Full	07/2015	06/2017
710878Q	Suurman-Majaneng	8, 76	14100	Below basic	Full	07/2015	07/2018
710878L	Stinkwater	13, 95	1400	Below basic	Full	07/2011	06/2015
710878M	Stinkwater Ext 1	14	690	Below basic	Full	04/2011	06/2013
710878N	Stinkwater Ext 2 to 8	14	5360	Below basic	Full	07/2015	07/2018
710878O	New Eersterust Ext 1 to 3	13	3300	Below basic	Full	07/2015	07/2017
710878P	New Eersterust Ext 4 to 7	13	4050	Below basic	Full	02/2016	07/2018

B.3.4.8.2 Informal Areas

The City completed the Sustainable Human Development Strategy / Informal Settlement Upgrade Plan. Refer to Section B.4 for the planned resettlements and/or in-situ residential upgrade program.

B.3.4.9 Future Bulk Water and Sanitation Infrastructure for Nodal Developments**B.3.4.9.1 Metropolitan Spatial Development Framework**

The hierarchy of nodes as per the Tshwane Metropolitan Spatial Development Framework (MSDF) is shown in Table B.3.4-7 below.

Table B.3.4-7: Hierarchy of Nodes

Hierarchy	Name	Description
1	Metropolitan	Widest range of services. Economic hubs, focal points for job opportunities
2	Region	Serves part of the urban area and significant at regional level. May evolve to Metropolitan
3	Emerging	Spontaneously emerging nodes with potential for greater development
4	Urban Core/ NDPG Programme	Restructuring nodes in essentially under-served residential townships

B.3.4.9.2 Strategic Grouping of Nodes

The division identified nine (9) strategic nodes in accordance with the hierarchy prescribed in the MSDF. The following items were explored within the said Strategic Nodes (Refer to Table B.3.4-8):

- Identification of node types
- Adequacy of bulk water and sanitation services for each Strategic Node
- Current and future main bulk infrastructure components for each Strategic Node
- The bulk infrastructure projects scheduled in the Draft 2015-2017 Medium Term Revenue Expenditure Framework (MTREF) for each Strategic Node according to the Master Plan for water and sanitation infrastructure development

Table B.3.4-8: Strategic Nodes according to the Water and Sanitation Masterplan

Region	Description	Node Types	Suburbs
2	1. Temba-Hammanskraal	3, 4	Babelegi, Temba, Hammanskraal
1, 2	2. Mabopane-Soshanguve	3, 4	Mabopane, Soshanguve
1,2, 5, 6	3. Zone of Choice	1, 2, 3, 4	Garankuwa, Rosslyn Pretoria-North, Sinoville, Montana
3, 6	4. CBD	1, 2, 3, 4	Pretoria, Sunnyside, Hatfield, Muckleneuck
3	5. Pretoria-West	4	Atteridgeville, Lotus Gardens, West Park, Danville
6	6. Mamelodi-Waltloo	3, 4	Silvertondale, Waltloo, Silverton, Eersterust, Mamelodi
6	7. Menlyn	1, 3	Brooklyn, Groenkloof, Waterkloof, Lynnwood, Menlyn, Faerie Glen, Garstfontein, Newlands
4, 6	8. Centurion	1, 3, 4	Lyttelton Manor, Highveld, Zwartkop
7	9. Ekangala-Bronkhorstspuit	2, 3, 4	Ekangala, Rethabiseng, Bronkhorstspuit

B.3.4.9.3 Node 1: Temba-Hammanskraal

Service adequacy of the strategic node is shown in Table B.3.4-9.

Table B.3.4-9: Service Adequacy of Node 1 - Temba-Hammanskraal

Water	The area is supplied by mainly water from Temba Water Purification Plant and a small
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	quantity from the Magalies Water Board Klipdrift Water Purification Plant.
Sanitation	The area drains to the Temba Waste Water Treatment Works
Adequacy of services	<p><u>Bulk Water:</u></p> <p>The Temba Water Purification Plant is being upgraded from 60MI/day to 120MI/day capacity. It is currently under pressure and the additional capacity will be available from June 2016.</p> <p>The recently completed additional reservoirs at Babelegi and Sekampaneng ensure sufficient bulk water storage.</p> <p><u>Sanitation:</u></p> <p>The Temba Waste Water Treatment Works upgrade project will go into construction in May 2012. The works has sufficient capacity for the current effluent, but the upgrade is required to cope with additional flow generated by the Backlog Eradication Program.</p> <p>The bulk sewer lines require upgrade simultaneously with the Backlog Eradication Program and this is scheduled together with the sewage reticulation projects.</p>

Water supply reservoirs of the strategic node are shown in Table B.3.4-10.

Table B.3.4-10: Water Supply Reservoirs of Node 1 - Temba-Hammanskraal

Source	Reservoir	Current Capacity (MI)	Future Capacity (MI)
Temba Water Purification Plant	Babelegi (1)	9.8	24.8
	Temba (4)	22.7	32.7
	Hammanskraal (2)	8.0	8.0
	Sekampaneng (1)	5.0	35.0
	Hammanskraal West (1)	12.0	36.0
	Total	57.5	136.5

B.3.4.9.4 Node 2: Mabopane-Soshanguve

Service adequacy of the strategic node is shown in Table B.3.4-11.

Table B.3.4-11: Service Adequacy of Node 2 - Mabopane-Soshanguve

Water	The area is supplied by water from the Rand Water Board
Sanitation	The area drains to the Klipgat Waste Water Treatment Works and the Rietgat Waste Water Treatment Works.
Adequacy of services	<p><u>Bulk Water:</u></p> <p>The Rand Water supply infrastructure includes reservoirs and is adequate for the current and future requirements</p> <p>The just completed 25MI Klip-Kruisfontein reservoir and the ongoing reinforcement of the 800mm bulk pipeline to serve the Klipgat, Mabopane and Winterveld reservoirs have contributed to currently adequate capacity in the bulk system</p> <p><u>Sanitation:</u></p> <p>Both Klipgat and Rietgat Waste Water Treatment Works have spare capacity with upgrades and extensions planned towards the end of this 5-year MTREF cycle.</p> <p>The bulk sewer lines are currently adequate.</p>

Water supply reservoirs of the strategic node are shown in Table B.3.4-12.

Table B.3.4-12: Water Supply Reservoirs of Node 2 - Mabopane-Soshanguve

Source	Reservoir	Current Capacity (MI)	Future Capacity (MI)
Rand Water Board	Winterveld (1)	10.0	10.0
	Klippan (2)	-	40.0
	Mabopane Central (1)	9.0	9.0
	Mabopane (1)	9.5	29.5
	Mabopane Main (Rand Water) (1)	55.0	55.0
	Soshanguve DD (2)	40.0	40.0
	Soshanguve L (2)	40.0	65.0

	Klipgat-Hospital (2)	6.2	16.2
	Kopanong (1)	5	5.0
	Total	174.7	269.7

B.3.4.9.5 Node 3: Zone of Choice

The zone of choice to the north of the Magaliesberg follows the spine of the N4 highway from Garankuwa in the west to the N1 highway in the east. Service adequacy of the strategic node is shown in Table B.3.4-13.

Table B.3.4-13: Service Adequacy of Node 3 - Zone of Choice

Water	<p>The area to the west of the Apies River is supplied by water purchased from the Rand Water Board</p> <p>The area to the east of the Apies River is in addition supplied by water from the CoT Water Purification Plant at Roodeplaat dam. In future this area shall be supplied from Roodeplaat only.</p> <p>Some of the supply zones are interconnected and may be supplied from either or both sources.</p>
Sanitation	<p>The smaller western area roughly west of the Mabopane Rail Link drains to the Sandspruit and Klipgat Waste Water Treatment Works</p> <p>The larger eastern area to the east of the Mabopane Rail Link drains to Rooiwal Waste Water Treatment Works.</p>
Adequacy of services	<p><u>Bulk Water:</u></p> <p>Bulk water is presently adequate, but will require upgrade and extension within 5 years as scheduled in the Master Plan.</p> <p><u>Sanitation:</u></p> <p>Bulk sanitation main outfall sewers are adequate, but Rooiwal Waste Water Treatment Works is currently being upgraded and will require additional upgrades before 2017.</p>

Water supply reservoirs of the strategic node are shown in Table B.3.4-14.

Table B.3.4-14: Water Supply Reservoirs of Node 3 – Zone of Choice

Main Source	Location	Reservoir	Current Capacity	Future Capacity
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			(MI)	(MI)
Rand Water	West of Apies River	Hartebeeshoek (RW)	100.0	100.0
		Florauna LL & HL	3.0	3.0
Rand Water	East of Apies River	Wonderboom	22.5	22.5
		Sinoville LL and HL	4.5	4.5
Roodeplaat WPP		Magalieskruin	4.5	20.0
		Montana	28.0	4.5
		Total	158.0	40.0

B.3.4.9.6 Node 4: CBD

Service adequacy of the strategic node is shown in Table B.3.4-15.

Table B.3.4-15: Service Adequacy of Node 4 - CBD

Water	The area is supplied by water from the Rand Water Board as well as from the Fountains.
Sanitation	The area drains to the Daspoort Waste Water Treatment Works and the Rooiwal Waste Water Treatment Works.
Adequacy of services	<p><u>Bulk Water:</u></p> <p>The Rand Water supply infrastructure is adequate for the current and future requirements.</p> <p>Use of the Fountains resource will continue.</p> <p><u>Sanitation:</u></p> <p>The Daspoort Waste Water Treatment Works has some spare capacity and the Rooiwal Waste Water Treatment Works is being upgraded.</p> <p>The bulk sewer lines are adequate.</p>

Water supply reservoirs of the strategic node are shown in Table B.3.4-16.

Table B.3.4-16: Water Supply Reservoirs of Node 4 – CBD

Source	Reservoir	Current Capacity (MI)	Future Capacity (MI)
Fountains	Findlay (1)	29.0	29.0
Rand Water Board	Meintjieskop (1)	9.1	9.1
	Muckleneuck (2)	28.3	60.3
	Salvokop (1)	27.0	27.0
	Total	93.4	125.4

B.3.4.9.7 Node 5: Pretoria-West

Service adequacy of the strategic node is shown in Table B.3.4-17.

Table B.3.4-17: Service Adequacy of Node 5 – Pretoria-West

Water	The area is supplied by water from the Rand Water Board.
Sanitation	The area drains to the Daspoort Waste Water Treatment Works and the Rooiwal Waste Water Treatment Works.
Adequacy of services	<p><u>Bulk Water:</u></p> <p>The Rand Water supply infrastructure is adequate for the current and future requirements.</p> <p><u>Sanitation:</u></p> <p>The Daspoort Waste Water Treatment Works has some spare capacity and the Rooiwal Waste Water Treatment Works is being upgraded.</p> <p>The bulk sewer lines are adequate.</p>

Water supply reservoirs of the strategic node are shown in Table B.3.4-18.

Table B.3.4-18: Water Supply Reservoirs of Node 5 – Pretoria-West

Source	Reservoir	Current Capacity (MI)	Current Capacity (MI)
Rand Water Board	Lotus Gardens	9.5	17.0
	Pretoria-West HL	22.8	17.0
	Pretoria-West LL	27.3	22.8

	Atteridgeville	29.5	27.3
	Atteridgeville HL	15.0	29.5
	Iscor	27.7	15.0
	Heights HL	92.0	27.7
	Heights LL	55.0	92.0
	Total	278.8	55.0
			286.3

B.3.4.9.8 Node 6: Mamelodi-Watloo

Service adequacy of the strategic node is shown in Table B.3.4-19.

Table B.3.4-19: Service Adequacy of Node 6 – Mamelodi-Watloo

Water	The area is supplied by water from the Rand Water Board
Sanitation	The area drains to the Baviaanspoort Waste Water Treatment Works and the Zeekoegat Waste Water Treatment Works
Adequacy of services	<p><u>Bulk Water:</u></p> <p>The Rand Water supply infrastructure is adequate for the current and future requirements. Rand Water is planning upgrades from the Rand Water Bronberg Reservoir to the Mamelodi Reservoir</p> <p><u>Sanitation:</u></p> <p>Both Zeekoegat and Rooiwal Waste Water Treatment Works are currently being upgraded</p> <p>The bulk sewer lines are currently adequate.</p>

Water supply reservoirs of the strategic node are shown in Table B.3.4-20.

Table B.3.4-20: Water Supply Reservoirs of Node 6 – Mamelodi-Watloo

Source	Reservoir	Current Capacity (MI)	Future Capacity (MI)
Rand Water Board	Waverley LL (1)	9.1	9.1

	Eersterust (1)	30.0	30.0
	La Montagne (1)	-	25.0
	Mamelodi R1 & R2 (2)	10.9	10.9
	Mamelodi R3 & R4 (2)	45.9	65.9
	Moreletta (1)	22.8	30.8
	Murrayfield (2)	2.5	2.5
	Total	121.2	174.2

B.3.4.9.9 Node 7: Menlyn

Service adequacy of the strategic node is shown in Table B.3.4-21.

Table B.3.4-21: Service Adequacy of Node 7 – Menlyn

Water	The area is supplied by water from the Rand Water Board.
Sanitation	The area drains to the Rooiwal Waste Water Treatment Works and the Zeekoegat Waste Water Treatment Works.
Adequacy of services	<p><u>Bulk Water:</u></p> <p>The Rand Water supply infrastructure is adequate for the current and future requirements.</p> <p><u>Sanitation:</u></p> <p>Both Zeekoegat and Rooiwal Waste Water Treatment Works are currently being upgraded</p> <p>The bulk sewer lines are currently adequate and the upgrade of the Moreletta outfall sewer is underway to maintain adequate capacity.</p>

Water supply reservoirs of the strategic node are shown in Table B.3.4-22.

Table B.3.4-22: Water Supply Reservoirs of Node 7 – Menlyn

Source	Reservoir	Current Capacity (MI)	Future Capacity (MI)
Rand Water Board	Klapperkop (4)	123.0	123.0

	Waterkloof (1)	22.8	22.8
	Waterkloof East (1)	8.0	8.0
	Carina Street (1)	5.0	9.0
	Waterkloofpark (1)	0.3	0.3
	Lynnwood (1)	17.0	17.0
	Parkmore LL (1)	9.1	19.1
	Parkmore HL (1)	9.1	19.1
	Koedoesnek LL (1)	11.4	26.4
	Constantia Park (1)	9.0	9.0
	Total	214.7	253.7

B.3.4.9.10 Node 8: Centurion

Service adequacy of the strategic node is shown in Table B.3.4-23.

Table B.3.4-23: Service Adequacy of Node 8 – Centurion

Water	The area is supplied by water from the Rand Water Board.
Sanitation	The area drains to the Sunderland Ridge Waste Water Treatment Works.
Adequacy of services	<p><u>Bulk Water:</u></p> <p>The Rand Water supply infrastructure is adequate for the current and future requirements.</p> <p><u>Sanitation:</u></p> <p>The Sunderland Ridge Waste Water Treatment Works is being extended. Phase 1 has just been completed and Phase 2 is underway for completion. Phase 3 needs to start 2016/17.</p> <p>The bulk sewer lines are currently adequate.</p> <p>Upgrade of the Rietspruit outfall sewer will be necessary in the next 5 years.</p>

Water supply reservoirs of the strategic node are shown in Table B.3.4-24.

Table B.3.4-24: Water Supply Reservoirs of Node 8 – Centurion

Source	Reservoir	Current Capacity (MI)	Future Capacity (MI)
Rand Water Board	Sunderland (1)	2.7	2.7
	Raslouw (1)	7.5	7.5
	Bakenkop (2)	25.9	25.9
	Clifton, Dommissie (3)	30.9	30.9
	Pierre van Ryneveld (2)	22.6	22.6
	Doringkloof (1)	10.0	10.0
	Brakfontein (1)	13.9	13.9
	Cornwall Hill Interim (1)	0.1	0.1
	Heuweloord (1)	10.0	10.0
	The Reeds (1)	6.0	6.0
	Rooihuiskraal (2)	14.5	14.5
	Louwlandia (1)	18.5	18.5
	Total	162.6	162.6

B.3.4.9.11 Node 9: Ekangala-Bronkhorstspuit

Service adequacy of the strategic node is shown in Table B.3.4-25.

Table B.3.4-25: Service Adequacy of Node 9 – Ekangala-Bronkhorstspuit

Water	The area is supplied by water from the Rand Water Board (Thembisile) and Bronkhorstspuit Water Treatment Works.
Sanitation	The area drains to the Godrich, Ekandustria and Ekangala Waste Water Treatment Works.
Adequacy of services	<p><u>Bulk Water:</u></p> <p>The Bronkhorstspuit Water Treatment Plant cannot be extended due to insufficient yield from the Bronkhorstspuit Dam. A new Rand Water pipeline is required from</p>

	<p>Mamelodi to Ekangala.</p> <p><u>Sanitation:</u></p> <p>The Ekangala Waste Water Treatment Works has recently been upgraded. The Godrich Waste Water Treatment Works need to be extended, to start 2017/18.</p> <p>The bulk sewer lines are currently adequate.</p>
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Water supply reservoirs of the strategic node are shown in Table B.3.4-26.

Table B.3.4-26: Water Supply Reservoirs of Node 9 – Ekangala-Bronkhorstspuit

Source	Reservoir	Current Capacity (MI)	Future Capacity (MI)
Rand Water	Ekandustria (1)	20.0	20.0
Bronkhorst-spruit Water Treatment Plant	Ekandustria (2)	25.0	36.5
	Brobhorstspuit (2)	32.7	50.0
	Nooitgedacht	-	9.0
	Tweespruit	-	2.5
	Total	77.7	118.0

B.3.4.10 Short-term Capital Expenditure Requirements (Draft)

The short-term draft capital expenditure requirements for Water and Sanitation projects are shown in Table B.3.4-27 and have been categorised according to the following intervention categories:

- Township establishment
- Water networks
- Waste water treatment works
- Backlog eradication
- Bulk water pipelines
- Deficient sewer replacements
- Reservoirs and pump stations

Table B.3.4-27: Short-term Budget Requirements for Water and Sanitation

Project Name	Project Number	Draft Budget 2015/16	Draft Budget 2016/17	Draft Budget 2017/18	Draft Budget 2018/19	Regions
Township Establishment						
Township water & sanitation services development: Tshwane contributions	710022	2,000,000	2,000,000	2,000,000	2,000,000	1,2,3,4,5,6,7
Water Networks						
Lengthening of network and supply pipelines	710023	10,000,000	2,400,000	5,000,000	5,000,000	4
Upgrading of networks where difficulties exist (Master Plan Items)	710024	1,400,000	3,000,000	3,000,000	3,000,000	1,2,3,4,5,6,7
Water supply to agricultural holdings	710025	2,828,527	3,000,000	3,000,000	3,000,000	2
Network upgrade and replacement of worn out network pipes	710026	80,000,000	80,000,000	80,000,000	80,000,000	1,2,3,4,5,6,7
Reduction water losses: water networks	711542	4,000,000	4,000,000	-	-	1,2,3,4,5,6,7
Establishment of Water Distribution Depots	712124	17,000,000	15,000,000	7,000,000	-	1,2,3,4,5,6,7
Relocation of fire hydrants	712813	-	-	-	-	1,2,3,4,5,6,7
Waste Water Treatment Works						
Sunderland Ridge WWTW: New 30ML/day BNR Module	710411A2	5,000,000	20,000,000	75,000,000	150,000,000	4
Zeekoegat WWTW: Sludge facility, New 50ML/day BNR Module	710411B	100,000,000	80,000,000			5
Klipgat WWTW: Sludge facility, anaerobic digester	710411C	21,500,000	58,500,000	100,000,000	100,000,000	1
Extension of Rooiwal WWTW: Sludge facility, 80ML.day BNR Module	710411D	221,601,006	320,000,000	285,000,000	255,000,000	2
Hennops River WWTW: New 50ML/day BNR Module	710411E	50,000,000	50,000,000			4
Baviaanspoort WWTW: Sludge facility, New 40 ML/day BNR module	710411F	5,000,000	8,000,000	60,000,000	260,000,000	6
Rietgat WWTW: Sludge facility, 7ML/day BNR re-commission, New 20ML/day BNR Module	710411G	29,000,000	124,000,000	120,000,000	16,000,000	1
Sandspruit WWTW: Sludge facility,, New 20ML.day BNR Module	710411H	20,000,000	23,000,000	15,000,000	50,000,000	1
Temba WWTW: New 20ML/day	710411I	40,000,000				2

Project Name	Project Number	Draft Budget 2015/16	Draft Budget 2016/17	Draft Budget 2017/18	Draft Budget 2018/19	Regions
Module						
Godrich WWTW: Sludge facility, New 10ML/day BNR Module	710411K		2,000,000	9,000,000	20,000,000	7
Cullinan/Refilwe WWTW: Effluent pump station & pipeline	710411L	3,000,000	2,000,000	-		5
New Lewzene WWTW (12ML/day)	710411R		50,000,000	60,000,000	40,000,000	5
Replacement, upgrading and construction of Waste Water Treatment Works	710411Z	8,000,000	10,000,000	10,000,000	10,000,000	1,2,3,4,5,6,7
Backlog Eradication						
Ramotse-Marokolong waterborne sanitation (Backlog Eradication)	710878	1,000,000	5,000,000	46,000,000	20,000,000	2
Mabopane water reticulation and bulk pipeline	710878C	7,000,000				1
Water reticulation Stinkwater Ext 2 to 8 and main supply line from Soshanguve reservoir DD	710878E	35,600,000				2
Ekgangala Block A & F Sewer reticulation and toilets	710878EK	25,000,000				2
Sewer Reticulation Kudube 5	710878K	20,000,000				2
Sewer Reticulation Stinkwater Ext 2 to 8	710878N	10,000,000	51,526,354	50,000,000		2
Sewer Reticulation New Eersterust Ext 1, 2, 3	710878O	20,000,000	36,016,203			2
Sewer Reticulation New Eersterust Ext 4 to 7	710878P	5,000,000	43,067,093	43,184,199		2
Sewer Reticulation Suurman, Mahemong, Majaneng	710878Q	20,000,000	58,187,744	68,959,027		2
Water reticulation Kudube 8	710878R	5,000,000	15,872,072			2
Sewer Reticulation Kudube 8	710878S		13,500,000	23,856,774		2
Temba Water Purification Plant Extension	710878T	244,000,000	100,000,000			2
Suurman, Mashemong water reticulation reinforcement	710878U	10,000,000				2
Provision of Communal Standpipes in Informal Settlements	710878V	5,000,000	15,000,000	15,000,000	15,000,000	3
Replace AC pipe reticulation network in Garankuwa	710878GK			-	2,000,000	1
Reticulation reinforcements in Winterveld X03	710878WV	1,000,000	5,000,000	-		1
Reticulation mains in	710878SG			1,000,000	13,000,000	1

Project Name	Project Number	Draft Budget 2015/16	Draft Budget 2016/17	Draft Budget 2017/18	Draft Budget 2018/19	Regions
Soshanguve DD and L reservoir zones						
Backlog eradication sewer reticulation in Rethabiseng (1130)	710878RT			-	2,000,000	7
Bulk Water Pipelines						
Replacement and upgrading of deficient bulk pipelines and Wonderboom Delivery Pipelines	711335D	27,000,000				2
Replacement and Upgrading of Bulk Water Pipeline Jamboree Rally to Francis Baard Street	711335H	10,000,000	25,000,000			3
Replacement and Upgrading of Bulk Water Feeder Main to Bakenkop Reservoir	711335I			1,000,000	5,000,000	4
Soshanguve feeder main to Reservoirs DD and L upgrade and replace	711335L				4,000,000	1
Waterkloof 2 Feeder main	711335O	1,000,000	10,000,000	15,000,000		4
Heights Iscor Feeder	711335P	4,000,000	16,000,000	10,000,000	8,000,000	3
Klippan PRV and new zone boundary between Mabopane main and Klippan zones	711335Q	2,000,000				1
Sterkfontein Feeder through Doringkloof	711335R	3,000,000				4
Kungwini West bulk system upgrade	711335S	10,000,000	17,000,000			6
Kungwini East bulk system: Bronkhorstspuit Reservoir zone eastern pipe reinforcement and PRV	711335T	2,000,000				7
Temba-Babelegi transfer upgrade	711335TB			2,000,000	10,000,000	2
Pumping system from Roodeplaat WTP to Doornpoort East/West reservoirs & Roodplaat-Doornpoort bulk pipe line	711335DP	2,000,000	20,000,000	45,000,000	40,000,000	2, 5
New feeder main for Garankuwa East reservoir & Garankuwa West Reservoir	711335GK		2,000,000	12,000,000		1
New outflow main for Orchards reservoir.	711335OR				1,000,000	1
Lynnwood road link pipe from Bronberg system to Garsfontein system	711335LW		1,000,000	10,000,000	5,000,000	6
New feeder main to Mnandi	711335MN	1,500,000	2,000,000			2, 5

Project Name	Project Number	Draft Budget 2015/16	Draft Budget 2016/17	Draft Budget 2017/18	Draft Budget 2018/19	Regions
reservoir						
New feeder main to Sutherland ridge reservoir and control room	711335SR	1,000,000	1,500,000			1
Replace feeder main from Garsfontein to Parkmore HL Reservoir	711335GF	3,000,000	8,000,000	4,000,000		1
Cathodic protection to all Steel pipes	711335CP	1,000,000	2,000,000	4,000,000	4,000,000	6
Mamelodi R5 feeder main relocation (1.341km long)	711335ML	3,000,000	15,000,000	10,000,000	9,000,000	1
Deficient Sewers Replacement						
Replacement of deficient sewers	711404	10,500,000	30,000,000	30,000,000	30,000,000	1
Establishment of WWC operational depots	712123	15,000,000	-	-	-	2
Water Treatment Plants						
Roodeplaat WPP extension by 30ML/day	711921D	4,000,000	15,000,000	80,000,000	53,000,000	5
Bulk sewers upgrade and replacement						
Moreletaspruit outfall sewer Phase 3	712121D	5,000,000	3,000,000			6
Rietspruit outfall sewer upgrade	712121E	10,000,000	30,000,000			4
Dorandia, Rosslyn, Theresa Park, Clarina outfall sewer upgrade	712121F			2,000,000	8,000,000	1
Silver Lakes outfall sewer upgrade Phase 1	712121G	10,000,000				6
Rietgat outfall Phase 1	712121RG	5,000,000	20,000,000	30,000,000	25,000,000	1
Reservoirs and Pump Stations						
Reservoir Extensions (Annlin)	712534A	13,400,000				2
Mooikloof Reservoir	712534D	16,000,000	20,000,000	13,300,000	11,000,000	6
Installation of bulk meters and loggers at reservoirs	712534E	2,000,000	2,000,000	2,000,000	2,000,000	1,2,3,4,5,6,7
Replace reservoir fencing	712534G	3,500,000	4,000,000	4,500,000	4,500,000	1,2,3,4,5,6,7
Relining/Upgrading reservoirs	712534H	6,000,000	4,000,000	4,000,000	4,000,000	1,2,3,4,5,6,7
New Klipgat Hospital 3 Reservoir	712534J	11,500,000	2,500,000			1
New 20 ML La-Montagne Reservoir	712534M		2,000,000	3,000,000	20,000,000	6
New Akasia Tank	712534O	5,500,000	2,000,000	1,500,000		2

Project Name	Project Number	Draft Budget 2015/16	Draft Budget 2016/17	Draft Budget 2017/18	Draft Budget 2018/19	Regions
New Doornpoort-West 1 Reservoir	712534P	2,000,000	21,000,000	15,000,000		6
New Highveld (Heritage Hill) Reservoir	712534Q		1,000,000	9,000,000	20,000,000	6
Klipfontein Reservoir pipework	712534R	10,000,000				1
New Parkmore LL Reservoir	712534S	24,000,000				6
Bronhorstbaai: Refurbishment and upgrade of clear-well and WPP infrastructure	712534T	12,000,000	15,000,000	10,000,000	4,000,000	7
Grootfontein Water Reservoir, Tower and pipework	712534U	10,000,000	9,000,000	3,000,000		6
Additional Mabopane 9 ML reservoir	712534MB	1,000,000	5,000,000	5,000,000	4,000,000	1
New 9ML Middelwater reservoir with feeder and outflow mains	712534MW				2,000,000	1
12 ML Mamelodi R5 Reservoir	712534ML	3,000,000	10,000,000	20,000,000	4,000,000	6
10ML Raslouw additional Reservoir and booster pump	712534RL	4,000,000	11,000,000	15,000,000	3,000,000	4
15ML additional Laudium reservoir	712534LD	2,500,000	10,000,000	5,000,000	7,500,000	3
New Pretoriusrand reservoir, feeder and outflow main	712534PR	4,000,000	15,000,000	20,000,000	5,000,000	4
Security Guards shelter units at reservoir	712534Z	500,000				1,2,3,4,5,6,7
First additional 10ML reservoir at Temba WTP	712534TB			1,000,000	10,000,000	2
Upgrading of Pump Stations	712147	-	500,000	-		4
TOTAL		1,289,829,533	1,551,069,466	1,468,300,000	1,349,000,000	

The short-term draft capital requirements listed in Table B.3.4-27 have been spatially referenced and mapped per sector. Water projects are shown in Figure B-23 and sanitation projects are shown in Figure B-24.

Figure B-23: Mapped Short-term Capital Expenditure Requirements - Water Projects

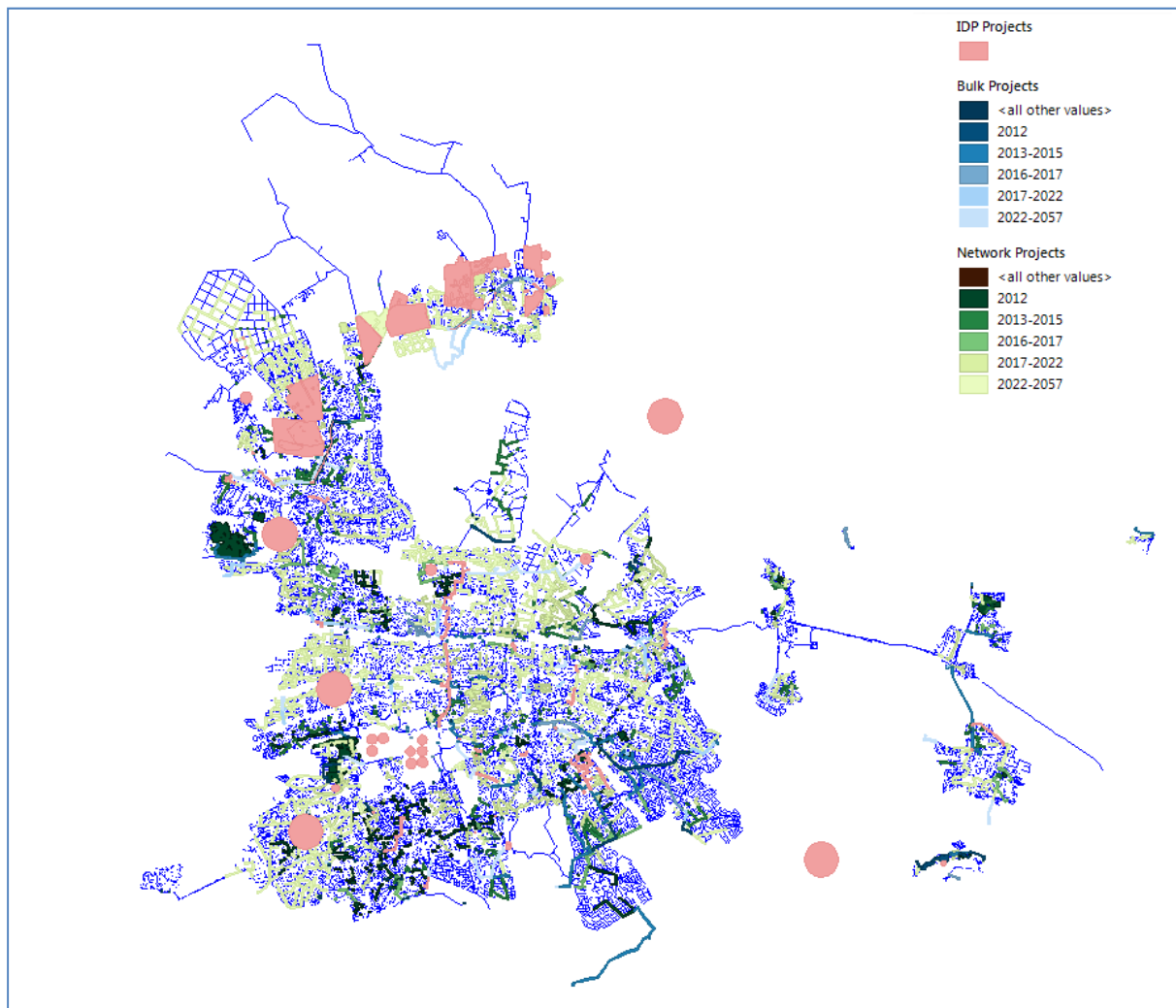
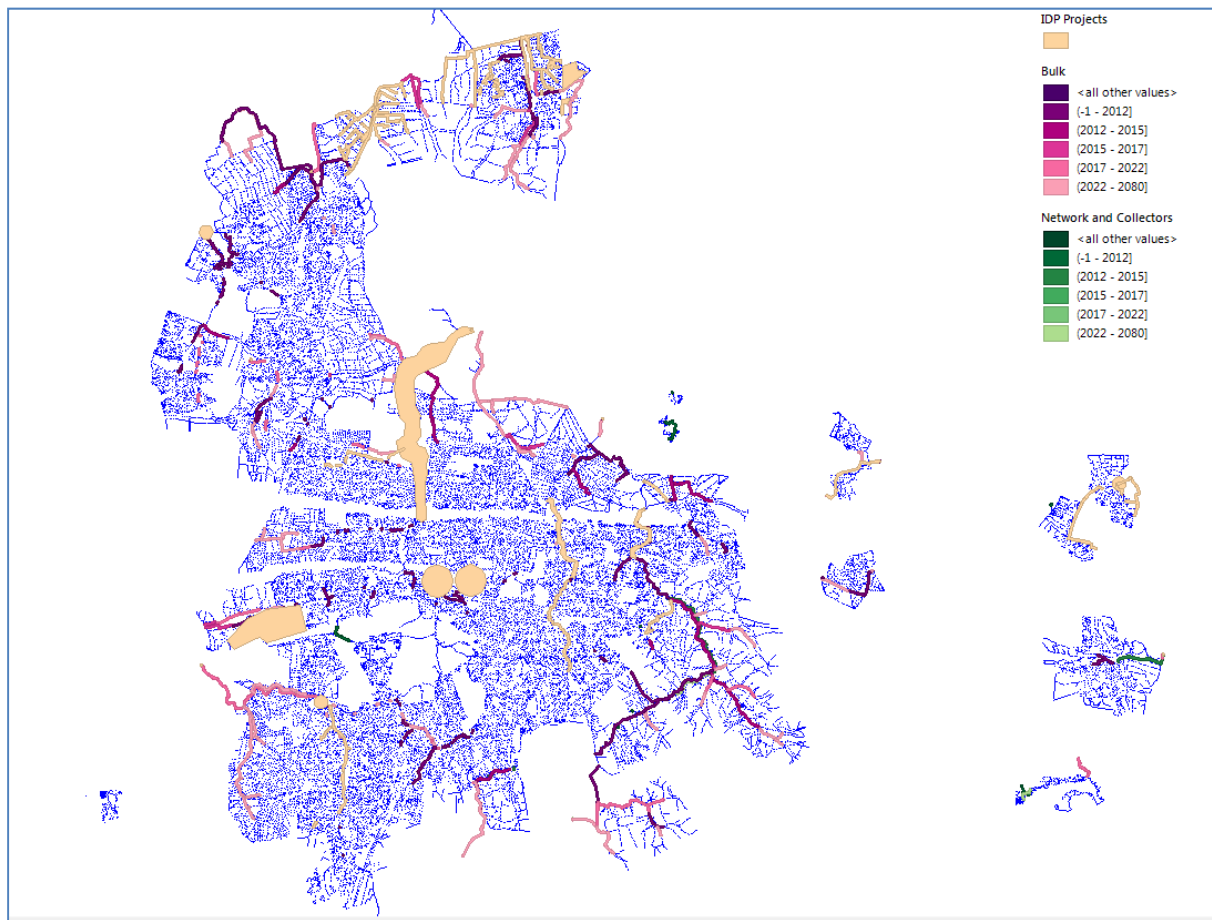


Figure B-24: Mapped Short-term Capital Expenditure Requirements - Sanitation Projects



B.4 Trends and Demand for Residential Infrastructure

BEPP Content Guidelines – as per BEPP Guidance Note 2015/16-2017/18

This section of the BEPP should seek to:

- Unpack housing by income group, location and cost (including property market developments and unmet demand) with specific focus on densification requirements, affordable or gap market needs, rental market (formal rental/social housing; informal rental such as additional dwelling on individually owned single stands);
- Unpack the management and upgrading of informal settlements;
- Unpack the management/prevention of illegal occupation of land and buildings; and
- Unpack the emergency housing for household living in life threatening conditions and or who are faced with eminent eviction.
- Provide the strategy to have better located housing development for the poor in relation to:
 - Densification
 - Access to urban opportunities
 - Integration with Public Transport (within 500m of public transport route/stop)

B.4.1 Housing Demand

Outputs from UrbanSim indicate an increase in the number of households within the City of Tshwane between the Census periods of 2001 and 2011 – see Table B.4.1-1. As noted in Figure B-25, household growth is highest within the low-income category. This correlates with an increased take up of land for residential purposes as a whole, but most notably within the informal settlement type categories – see Figure B-26.

Table B.4.1-1: Household Growth by Region

Region	2001	2011	Growth
1	182 126	273 429	91 303
2	70 351	94 228	23 877
3	135 285	168 972	33 687
4	69 544	109 535	39 991
5	18 220	23 515	5 295
6	129 111	186 517	57 406
7	25 915	37 946	12 031
Total	630 552	894 142	263 590

Figure B-25: Household Growth by Modified Sub Place and Income

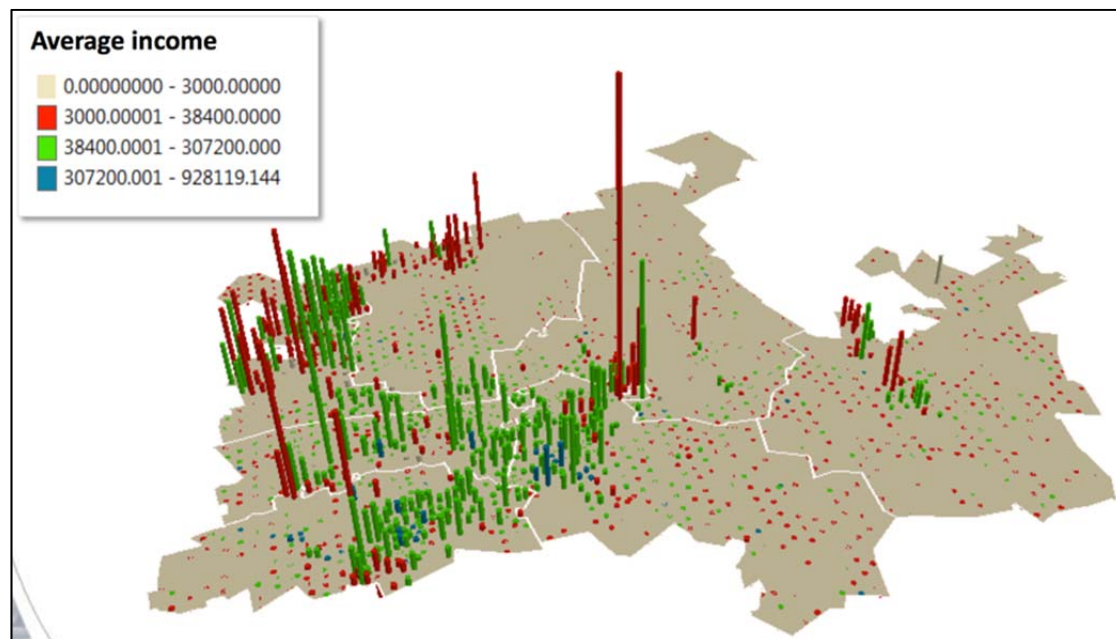
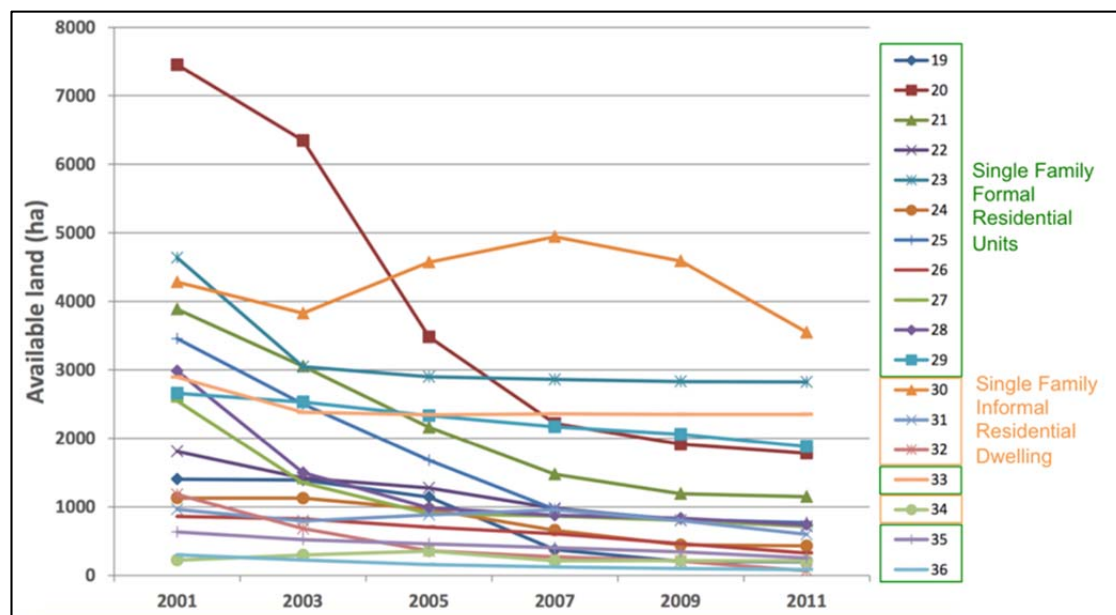


Figure B-26: Consumption of Land for Residential Purposes



An analysis of the conversion of land that was vacant in 2011 and that now accommodates residential land use indicates that approximately 88% now accommodates formal residential housing, whilst 12% of previously vacant land now accommodates informal settlements. The largest take up of land for informal residential housing (approximately 61%) has occurred within Region 6.

Table B.4.1-2: Conversion of Vacant Land for Residential Purposes

land_use_type	Region							Total
	1	2	3	4	5	6	7	
19			2	95	132	580		809
20		380	2 092	6 492	1 007	9 985	2 016	21 972
21	596	234	12	6 613	54	3 914		11 423
22	202	1 275	145	5 564		4 758	7	11 951
23	4 054	3 163	974	298	149	295	9	8 942
24	155	1 883	278	286	59	34		2 695
25	9 216	2 237	8 447	6 328	1 797	6 865		34 890
26	1 027	4 532			367	4 351	1 018	11 295
27	15 341	109		24	119	348	766	16 707
28	15 781	935	1 763		1 483	111	1 453	21 526
29	4 974	58	283	1 647	431	5 411		12 804
30	631	233	97	22	7	764	754	2 508
31	103	774		439				1 316
32		910	4	3 849	391	12 271	81	17 506
33	13	51	16	31	45	46	50	252
34	8							8
35		0	391			0		391
36			255	45				300
37	182	2	312	121		523	59	1 199
Total	52 283	16 776	15 071	31 854	6 041	50 256	6 213	178 494

Single Family
Formal
Residential
Units

Single Family
Informal
Residential
Dwelling

2011/2012 surveys of informal settlements undertaken as part of the Sustainable Human Settlement Plan indicate approximately 164 014 informal structures within the City of Tshwane compared to 139 529 in 2009 and 146 304 recorded in 2006. These informal structures exist in a total of 130 clusters. A reduction in informal structures between 2009 and 2006 was recorded in the Temba area where several large-scale programmes have been implemented, especially in the Hammanskraal South Extensions. Other areas showing a significant reduction in numbers include Soshanguve North where extensive infill developments were completed; as well as Atteridgeville; and Olievenhoutbosch. The most notable growth was recorded in the Mamelodi area where, despite the implementation of several large projects, the informal settlement count has increased significantly per annum, in line with the findings documented in Table B.4.1-2.

The largest concentrations of informal settlement occur in Regions 1 and 2 (the Temba-Hammanskraal and Garankuwa-Mabopane-Soshanguve and Winterveldt areas) respectively, followed by Region 6 (Mamelodi) and Region 3 (Atteridgeville).

Figure B-27: Informal Settlement Distribution

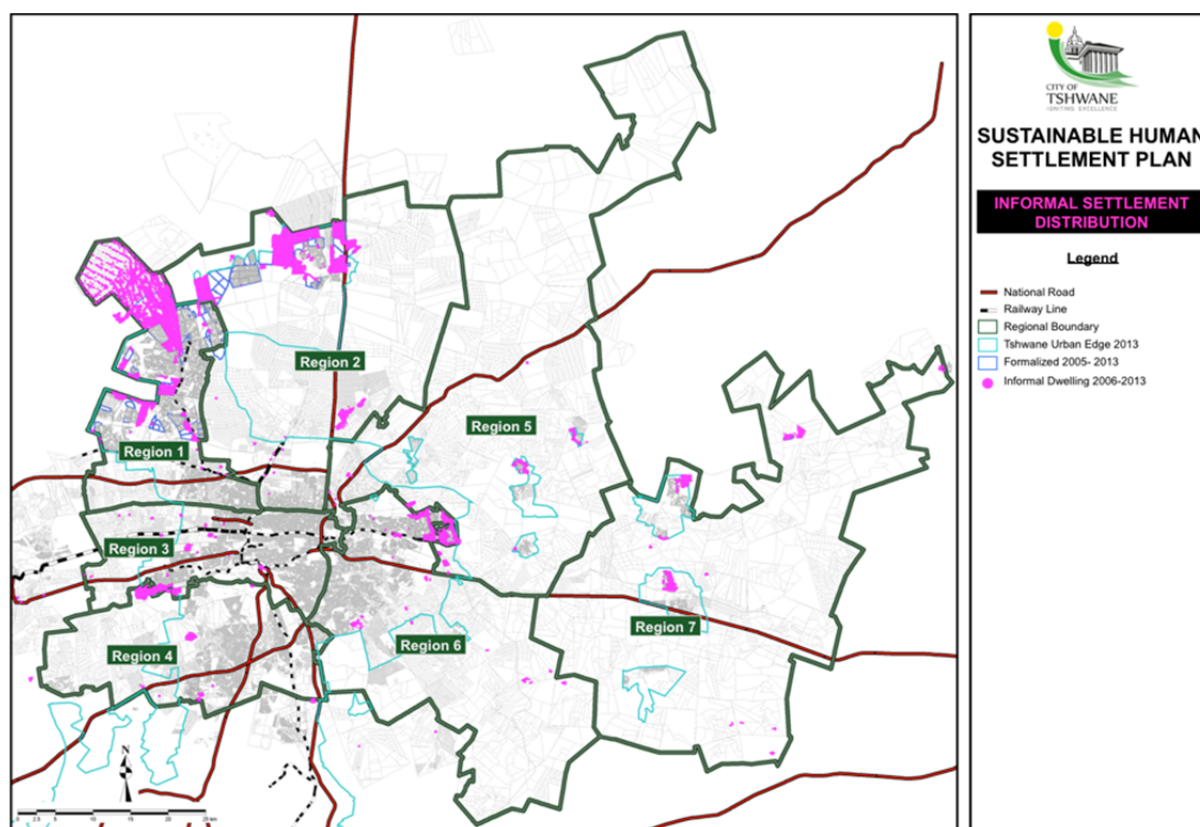


Table B.4.1-3: Number of Informal Units per Region (2006 – 2013)

REGION	2006	%	2009	%	2011	%	2013	%	2006 - 2009	2009-2011	2011-2013	2006-2013	Average change p.a.
Region 1	38 526	26%	36 221	25%	38 335	24%	33 991	22%	-2 305	2 114	-4 344	-4 535	-648
Region 2	44 803	31%	37 483	26%	38 918	24%	33 399	21%	-7 320	1 435	-5 519	-11 404	-1 629
Region 3	12 674	9%	11 606	8%	15 411	10%	18 665	12%	-1 068	3 805	3 254	5 991	856
Region 4	16 289	11%	16 196	11%	16 956	11%	16 933	11%	-93	760	-23	644	92
Region 5	3 524	2%	4 903	3%	7 012	4%	8 942	6%	1 379	2 109	1 930	5 418	774
Region 6	24 779	17%	30 389	21%	35 045	22%	34 153	22%	5 610	4 656	-892	9 374	1 339
Region 7	5 369	4%	8 677	6%	8 887	6%	9 865	6%	3 308	210	978	4 496	642
Total Tshwane Informal Housing	145 964	100%	145 475	100%	160 564	100%	155 948	100%	-489	15 089	-4 616	9 984	1 426

In addition to informal housing units, 83 378 backyard units have additionally been identified, which provide an indication of affordable rental demand – see Table B.4.1-4.

With consideration of the number of informal units and backyard units, in addition to the current registered demand for subsidised housing, the current total residential housing demand is estimated to be approximately 390 494 housing units – see Table B.4.1-5.

Table B.4.1-4: Backyard Units within the City of Tshwane (2009)

SETTLEMENT AREA	2009
Temba	7 427
New Eersterus	2 196
Winterveld	359
Mabopane	1 401
Garankuwa	2 762
Soshanguve North	10 879
Soshanguve South	5 425
Atteridgeville	9 446
Mamelodi	31 649
Centurion	7 165
Refilwe	967
Zithobeni	1 287
Ekangala Ext	2 094
Rethabiseng	321
TOTAL	83 378

Table B.4.1-5: Total Residential Housing Demand

DEMAND	UNITS
- Informal Housing Counts	155 948
- Backyard units (Affordable Rental Demand)	83 378
- Demand database (Subsidised Housing Demand)	151 168

B.4.2 Consolidation and Formalisation Programme

The consolidation and formalisation programme is largely focused on the upgrading of the informal settlement areas. This programme includes the identification of in-situ upgrade areas, as well as the identification of informal settlement areas that are to be relocated and the receiving areas that are to accommodate those relocations. Figure B-28 indicates the areas that form part of the consolidation and formalisation programme. Table B.4.2-1 indicates that the consolidation programme generates a housing supply of approximately 182 308 residential units.

Figure B-28: Consolidation and Formalisation Programme

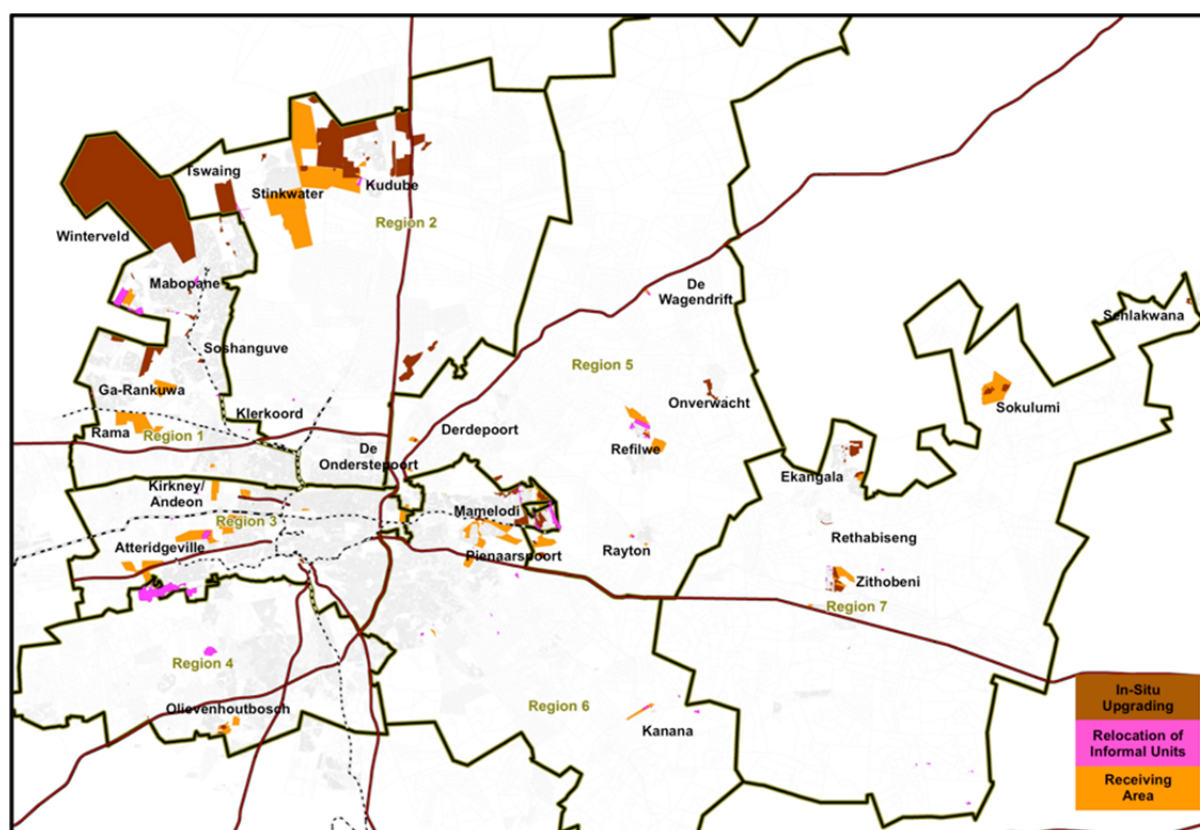


Table B.4.2-1: Consolidation Programme – Low Income Housing Supply

	NUMBER OF UNITS					COMMENTS ON ALLOCATION
	DEMAND	SUPPLY	SUPPLY minus DEMAND	TOTAL ALLOCATED	NOT ALLOCATED	
Region 1	33 991	39 127	5 136	31 932	2 059	Rural + Occupants in Koos de la Rey street (1660units)
Region 2	33 399	40 474	7 075	33 052	347	Rural
Region 3	18 665	25 319	6 654	16 496	2 169	Rural + Itereleng (Lotus G not available to relocate)
Region 4	16 933	13 713	-3 221	13 674	3 259	Rural + Mooiplaats
Region 5	8 942	15 886	6 944	8 696	246	More land needed in the vicinity of Derdepoort/Kameeldrift
Region 6	34 153	36 412	2 259	33 707	446	Rural. Surplus exist because of medium densities used
Region 7	9 865	11 378	1 513	9 604	261	Rural
TOTAL	155 948	182 308	26 360	147 161	8 787	

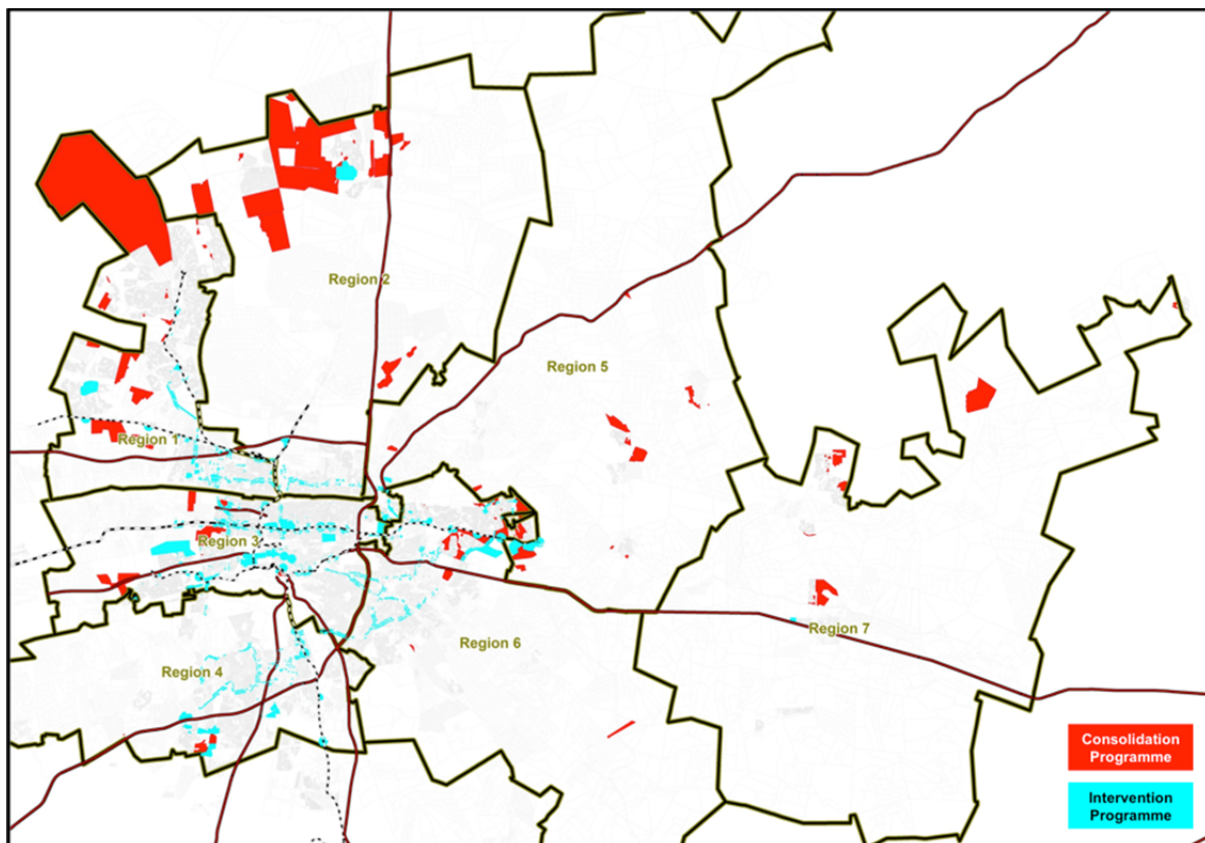
B.4.3 Intervention Programme

The intervention programme considers the proactive provision of housing in line with the City's spatial policy's i.e. the provision of high density housing within mixed-use, walkable transit precincts. The intervention programme includes the following – refer to the housing intervention areas in Figure B-29:

- Integrated residential development on council owned strategic developable land, as well as government owned vacant land – refer to Figure B-32, Figure B-33 and Table B.4.3-2;
- The redevelopment of land within the Inner City and Pretoria West – refer to Figure B-34;

- Subsidised rental projects within the region – refer to Figure B-35;
- Subsidised housing projects on vacant private land – refer to Figure B-36; and
- High-density residential housing (an average of 80 du/ha) along IRPTN corridors and surrounding IRPTN stations, as part of the compaction and densification strategy – refer to Figure B-39. Along TRT corridors a densification buffer of 200m is assumed, whilst a 500m buffer is considered around all rail stations.

Figure B-29: Location of Housing Intervention Programmes and Housing Consolidation Programmes



B.4.3.1 Housing Provision on Council Owned Strategic Developable Land

The city is in the process of developing a Land Release Strategy and is also exploring various mechanisms in respect of its real estate property. Parallel to this process is the development of the Property Management Strategy, which will focus on the illegal occupation of Council owned land and buildings. As part of the Land Release Strategy, the Council has identified and approved the release of about 35 strategic land parcels located throughout the City, with the intention that the development of these land parcels act as a catalyst for economic growth locally and within the metropolitan context as a whole. As a first phase in the process, it was decided to release 12 land parcels to the private sector and to publish a call for proposals towards the development of these.

The table below summarises the main features and size of each of these land parcels identified as part of Phase 1.

Table B.4.3-1: Council Owned Strategic Developable Land

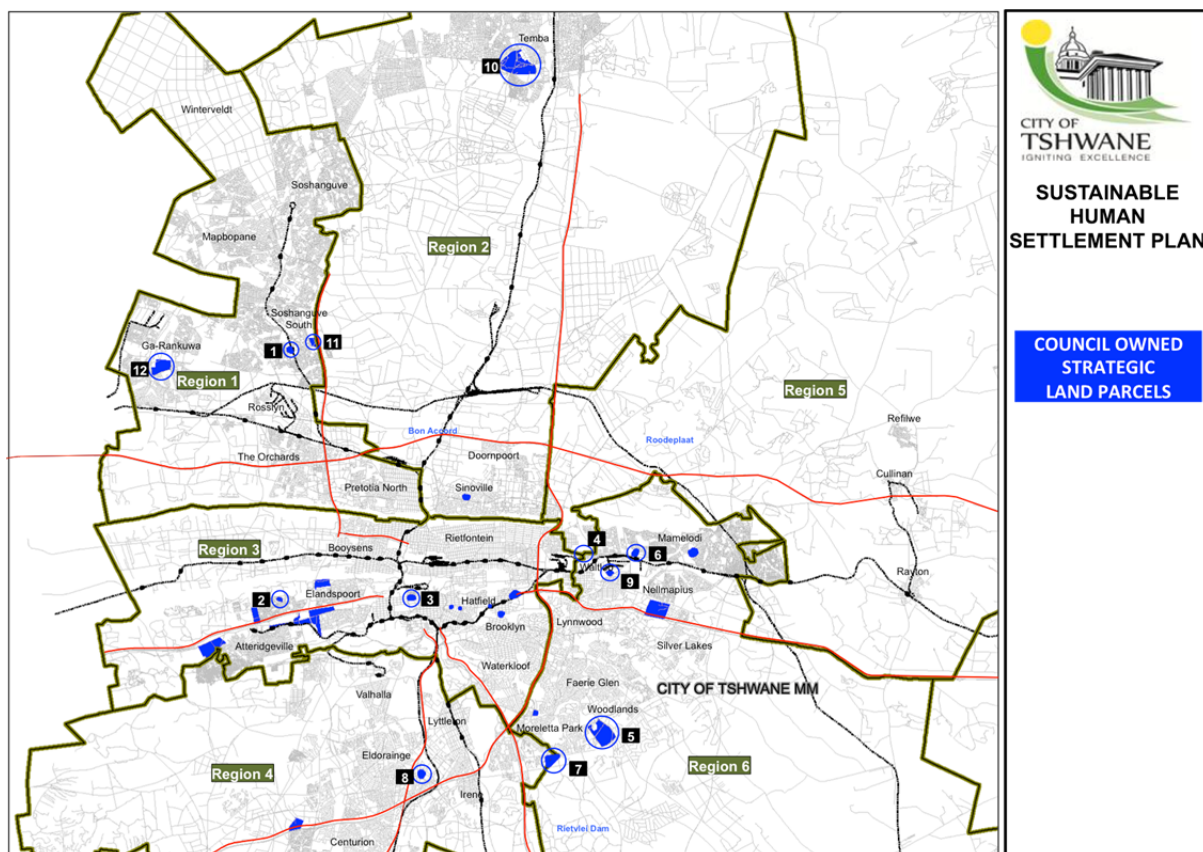
Property Description	Extent (ha)	Potential land uses
Erven 20886 to 20918 Soshanguve South Ext 14	± 7,2 ha	Mixed uses development (light industrial, offices, retail, community facilities etc).
Lotus Gardens Erf 2	13,1797 ha	CBD, Mixed use, Primary Lotus Gardens Activity Node
Erf 3525, Pretoria Ext 14	4,45 ha	Appropriate land use to be investigated.
Portion 3 and 4 of Erf 158 Watloo	15,66 ha	General Industrial – zoning is in place
Remainder extent of Portion 279 and 285 of the farm Garstfontein 374 JR	± 216,6 ha	Mixed uses development, Higher Density Housing, Social facilities (schools), offices, retail, community facilities etc.
Erven 35383, 35386, 35387 Mamelodi Ext 13 (Denneboom)	4,35 ha	Appropriate land use to be investigated.
Portion 60 (a portion of Portion 1) of the farm Rietvallei 377R	16,0923 ha	Appropriate land use to be investigated.
Remainder of portion 20 of the farm Olievenhoutbosch 389 JR	64,7 ha	Appropriate land use to be investigated.
Portion 191 Hartebeestpoort 328 JR (vacant land surrounding Municipal Testing grounds)	2,7797 ha	Restricted industrial.
R/1 Leeuwkraal 92 JR	1027,0547 ha	Urban Core, Inter modal transport facility, mixed use.
Portion 15, 16 of the farm Kruisfontein 259 JR	21,4133 ha	Mixed land use.
Remainder of Erf 8873 GaRankuwa Unit 5	± 90 ha	Social facilities (affordable housing, swimming pool, library, community hall, indoor sport, disability centre).

Criteria used to identify the land parcels considered include:

- Land parcels owned by Council;
- High potential for PPP engagement in line with interest shown by private investors and developers;
- Location either within the 8 Inner City Precincts, and/or within a 1 km radius of TRT route, Regional offices, NDPG Nodes (Urban Hubs/Urban Cores) and Activity Corridors.

A total of 1 483 hectares of land was identified as part of Phase 1, and as illustrated in Figure B-73 these sites are mostly located in or close to previously disadvantaged communities on strategically located vacant land close to, or within, existing or proposed future activity nodes.

Figure B-73: Council Owned Strategic Developable Land Parcels

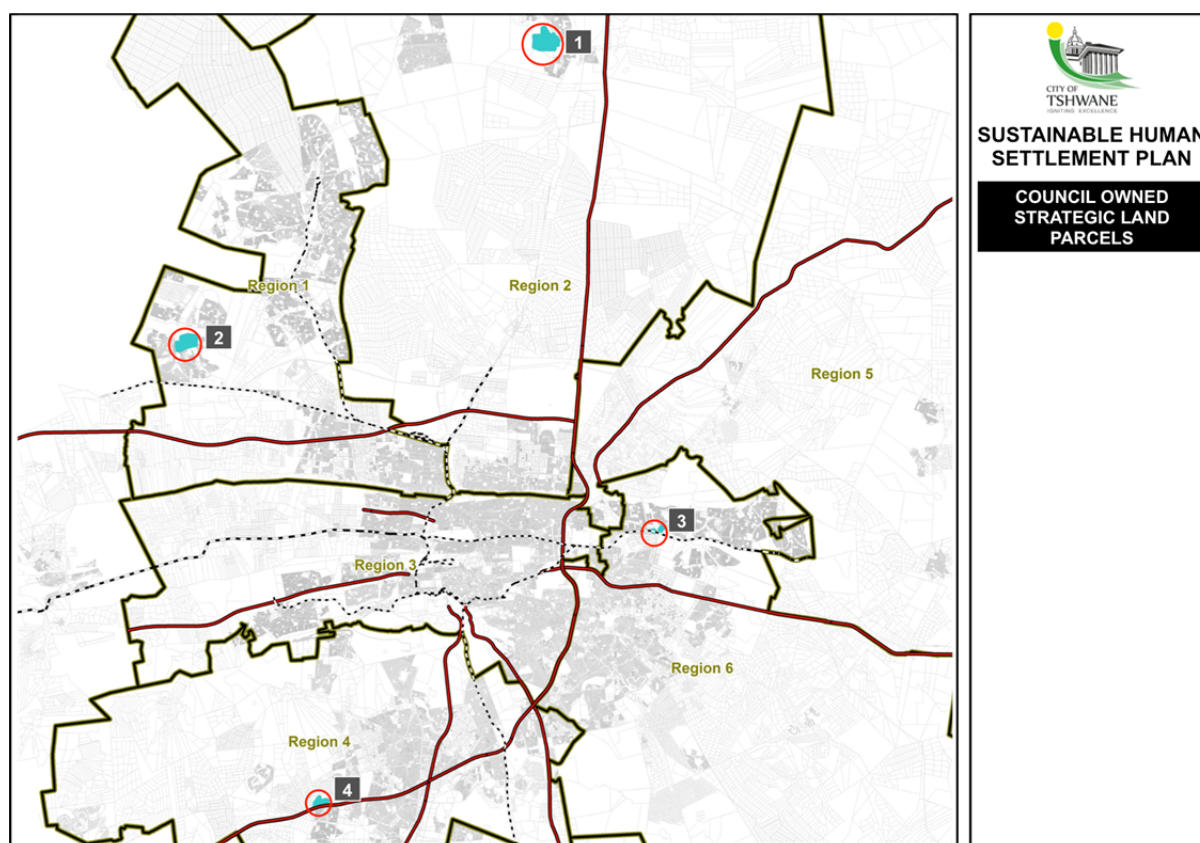


The following land parcels have since specifically been identified for the purposes of housing provision, and can accommodate a total of 11 002 medium density residential units.

Figure B-74: Housing Provision on Council Owned Strategic Developable Land

Number	Priority SDAs	Area (ha)	Residential Units
1	R/1 Leeuwkraal (Temba)	169.4	5 200
2	R/8873 Garankuwa Unit 5	90.0	3 906
3	Erven 35383,35386,35387 Mamelodi Ext. 13	4.4	696
4	Ptn 20/R, Olievenhoutbosch 389 JR	36.5	1 200
Total		300.2	11 002

Figure B-32: Housing Provision on Council Owned Strategic Land Parcels



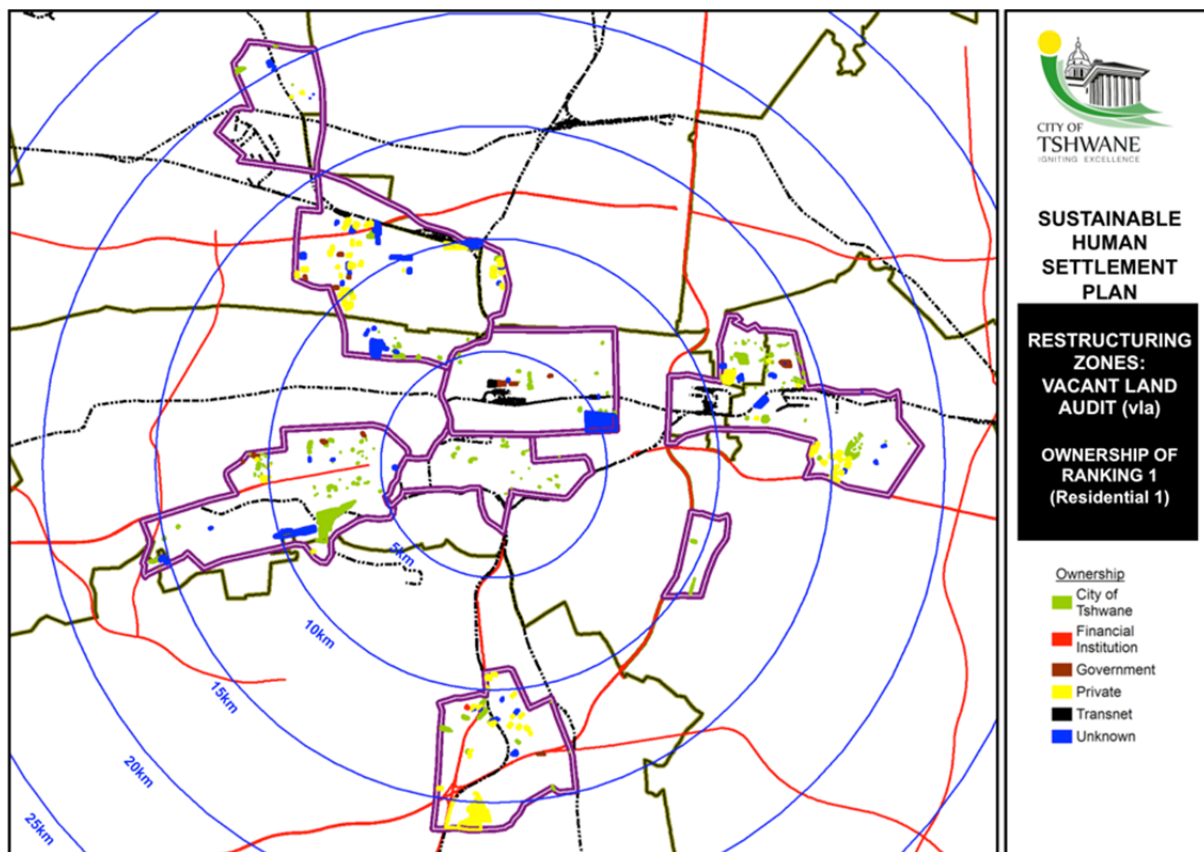
B.4.3.2 Housing Provision on Council Owned Vacant Land

A vacant land audit of existing government owned land was additionally undertaken. This included vacant land owned by the City of Tshwane, as well as other government entities and parastatals. Existing vacant land within the Region is depicted in Figure B-33. Assuming medium density residential development (80 du/ha) on these land parcels, an additional 71 477 housing units can be provided.

Table B.4.3-2: Housing Provision on Council Owned Vacant Land

	RANKING 1 (ha)							
Region	City of Tshwane	Financial Institution	Government	Private	Transnet	Unknown	Total	%
Region 1	13		6	83	6	50	157	18%
Region 2	2			15		18	35	4%
Region 3	136		18	7	9	188	357	40%
Region 4	24	1	2	141		19	187	21%
Region 5	19			22		6	46	5%
Region 6	30		9	43		28	111	12%
Region 7							0	0%
TOTAL HA	225	1	35	311	14	308	893	100%
%	25%	0%	4%	35%	2%	34%	100%	
UNITS (at 80du/ha)	17 967	103	2 761	24 862	1 128	24 655	71 477	

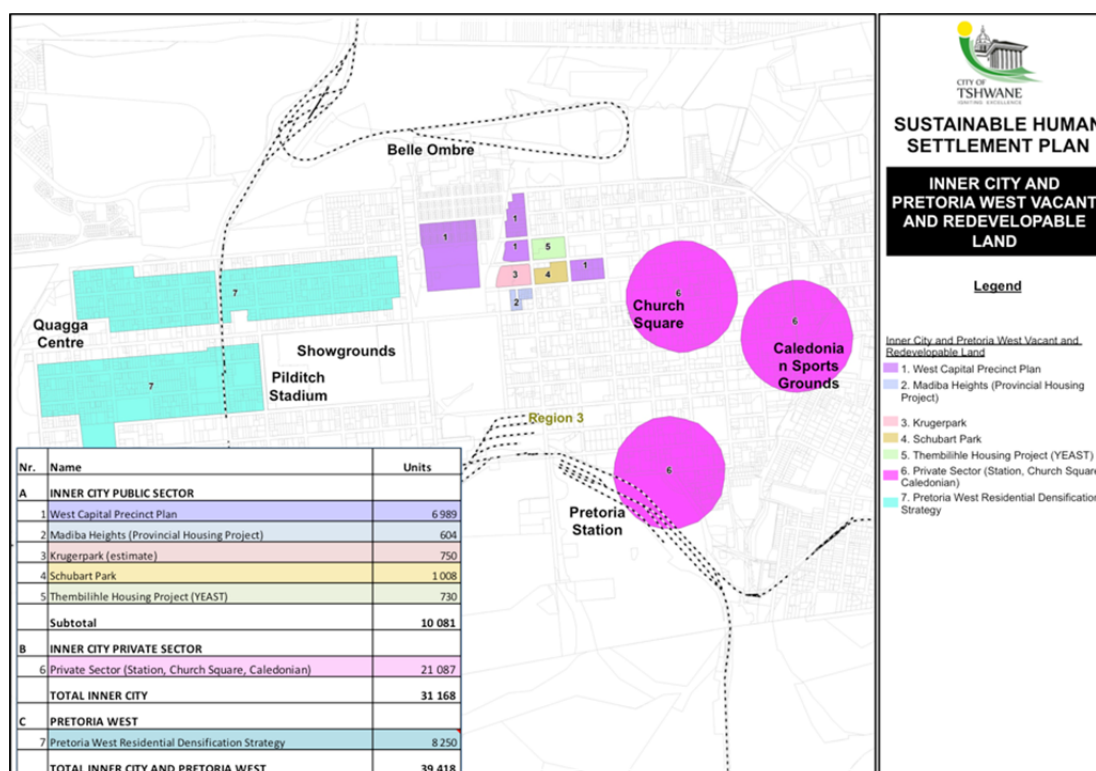
Figure B-33: Vacant Land Audit



B.4.3.3 The Redevelopment of Land within the Inner City and Pretoria West

As part of the City of Tshwane Inner City Revitalisation Strategy, the redevelopment of land within the Inner City and Pretoria West for residential purposes has been identified in line with the principles of compaction and densification. Approximately 39 418 residential units are to be provided as part of this strategy.

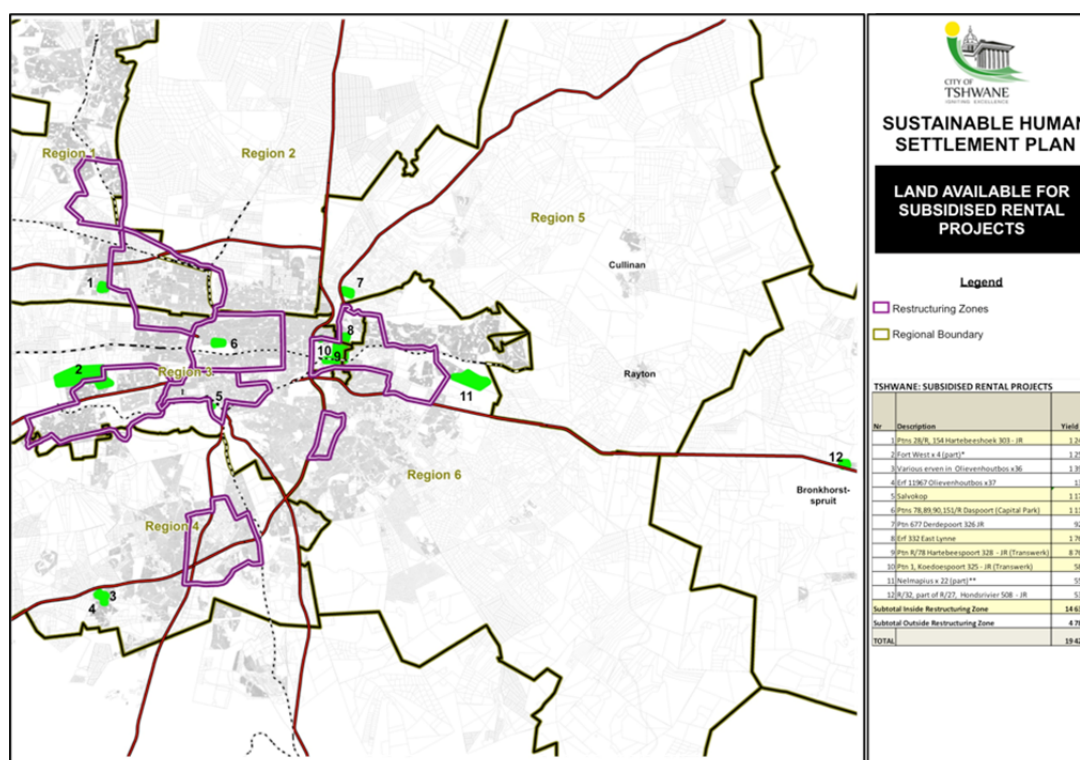
Figure B-34: Redevelopment of Land within the Inner City and Pretoria West



B.4.3.4 Subsidised Rental Projects

A number of rental projects have been identified across the City. This program yields approximately 19 422 subsidised residential units.

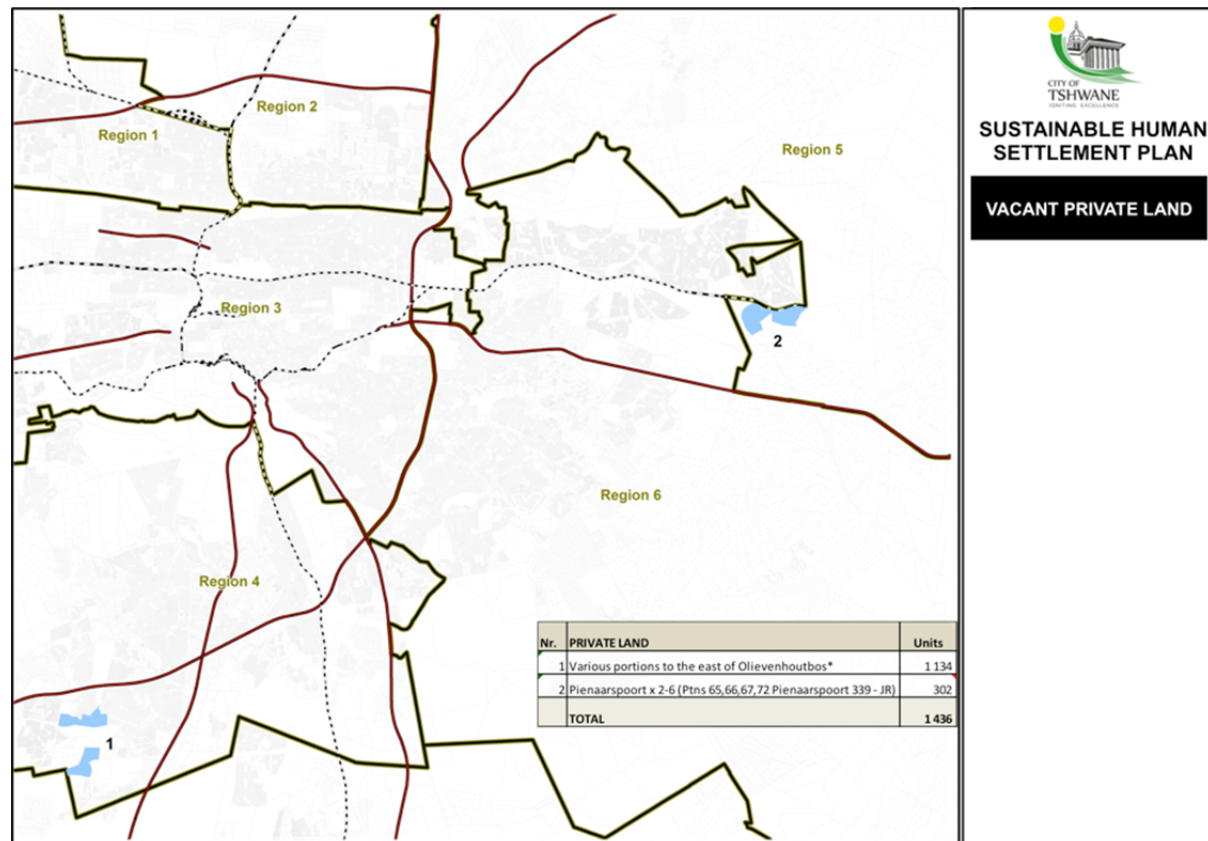
Figure B-35: Subsidised Rental Projects



B.4.3.5 Subsidised Housing on Vacant Private Land

In addition to City funded housing programmes, the City has partnered with private developers to establish housing schemes on vacant private land parcels within the City. It is anticipated that the current programme will yield a total of 1 436 residential units.

Figure B-36: Subsidised Housing on Vacant Private Land



B.4.3.6 Residential Densification along IRPTN Corridors

As part of the development of the IRPTN, a housing densification strategy along the IRPTN corridors was established. As part of this Local Corridor Analysis, the rail system, as well as the respective TRT lines were assessed.

B.4.3.6.1 Points of Departure/ Principles

A number of principles were taken as points of departure for the detailed Local Corridor Analysis. These include:

- The principle of densification along TRT Corridors and around railway stations (TOD development) as promoted by the MSDF and RSDFs of the City;
- That existing PRASA rail infrastructure would be optimised, because rail is the backbone of the IRPT Network; and

- That brownfields sites would be optimised, and infill development on vacant land pockets would be prioritised before expanding the urban footprint.

B.4.3.6.2 Methodology

The Local Corridor Analysis was conducted in the following manner:

- Firstly, a conceptual/ high-level analysis was conducted for each of the rail and TRT sections respectively.
- The prominent land uses within the functional service area of IRPTN stations and corridors were identified.
- Following from that, a buffer of 200m was drawn along the length of the TRT corridors (RSDF standard), and a 500m buffer around all railway stations (RSDF minimum standard).
- Vacant land parcels or those with potential for redevelopment within the buffer zones were isolated on GIS.
- Next, the identified land parcels were categorised (in terms of suitability for development) into one of the following categories depending on development trends in the surrounding area, physical access to the sites, and existing development on the site:
 - Residential infill development, redevelopment, or densification;
 - Mixed use infill development or redevelopment;
 - Industrial infill development (only in existing industrial areas)
- Finally, the land parcels were measured and their development capacity quantified at an average density of 80 dwelling units per hectare (Ha) to determine the possible residential yield of land within walking distance of the IRPT Network.
- The figures were totalled per category per Tshwane traffic zone, to calculate a subtotal of residential capacity/ potential yield per route section and per station precinct of the entire Network.

B.4.3.6.3 Rail: Residential Development Capacity

Figure B-80 and Table B.4.3-3 depict the areas earmarked for residential development along the railway network of the IRPTN, as well as the residential development capacity derived from this. The total residential yield along the railway network is estimated at approximately 65 048 units. The majority of these units (48%) is earmarked for low-income development and this translates into approximately 31 301 units. The middle-income yield stands at 23 594 units, while it is estimated that approximately 10 154 units for the high-income group can be developed around railway stations along the Tshwane IRPTN rail network.

The rail sections with the highest potential for low income development include the section from Mabopane to Daspoort (3554 units), the section along Van der Hoff Drive from Mooka to Machielsnek with a potential yield of 3 748 units, the Panpoort to Koedoespoort section in Mamelodi with an estimated yield of 7 667 units, and the northern section of the ring rail from Queenswood to Capital Park West which could yield approximately 6 977 low income units. This is also the section of the railway network with the highest total potential (all income groups) for residential development with a total estimated yield of 18 548 units. This is due to the Capital Park site that could yield a significant amount of residential units within the residential fabric of the Moot area.

Table B.4.3-3 provides the detailed information with the percentage income group allocation assigned to the individual rail sections as was used in this scenario.

Figure B-80: Development Potential - Rail

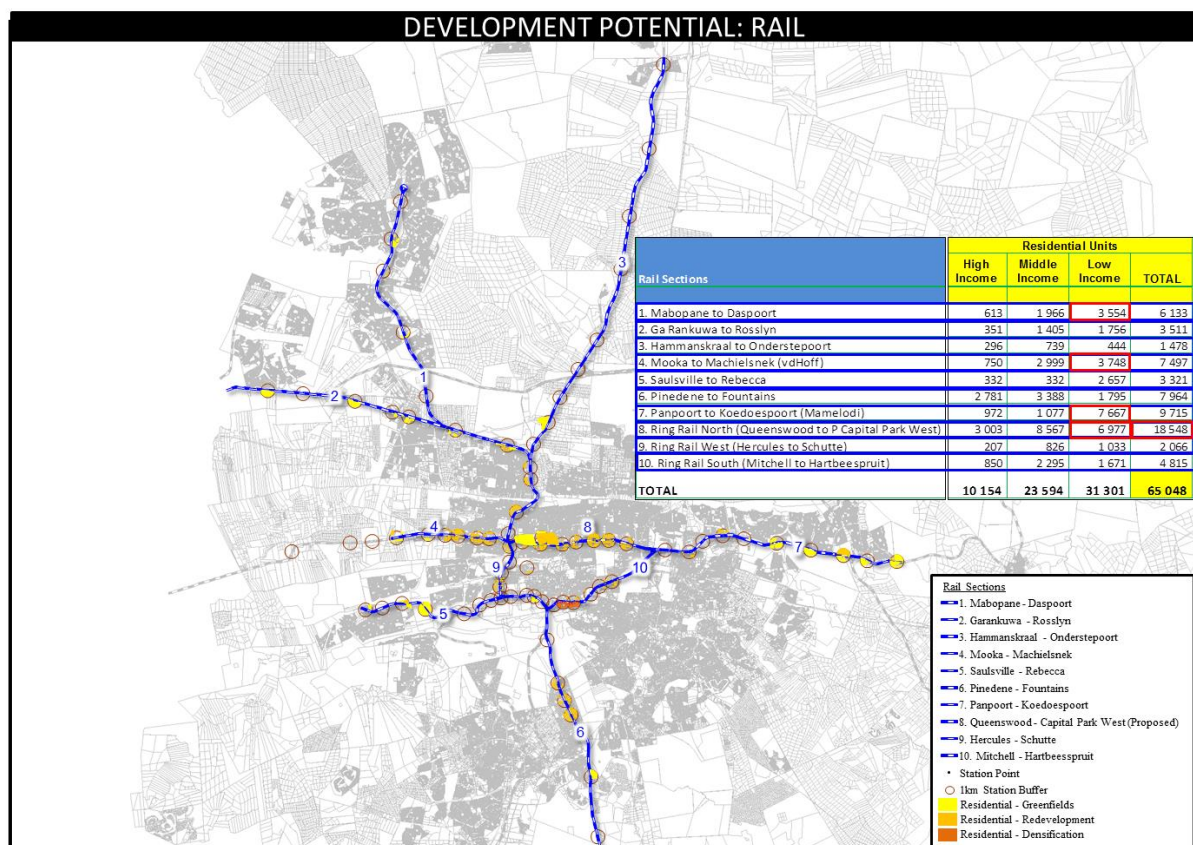


Table B.4.3-3: Rail: Land Identified for Development around Stations (500m radius)

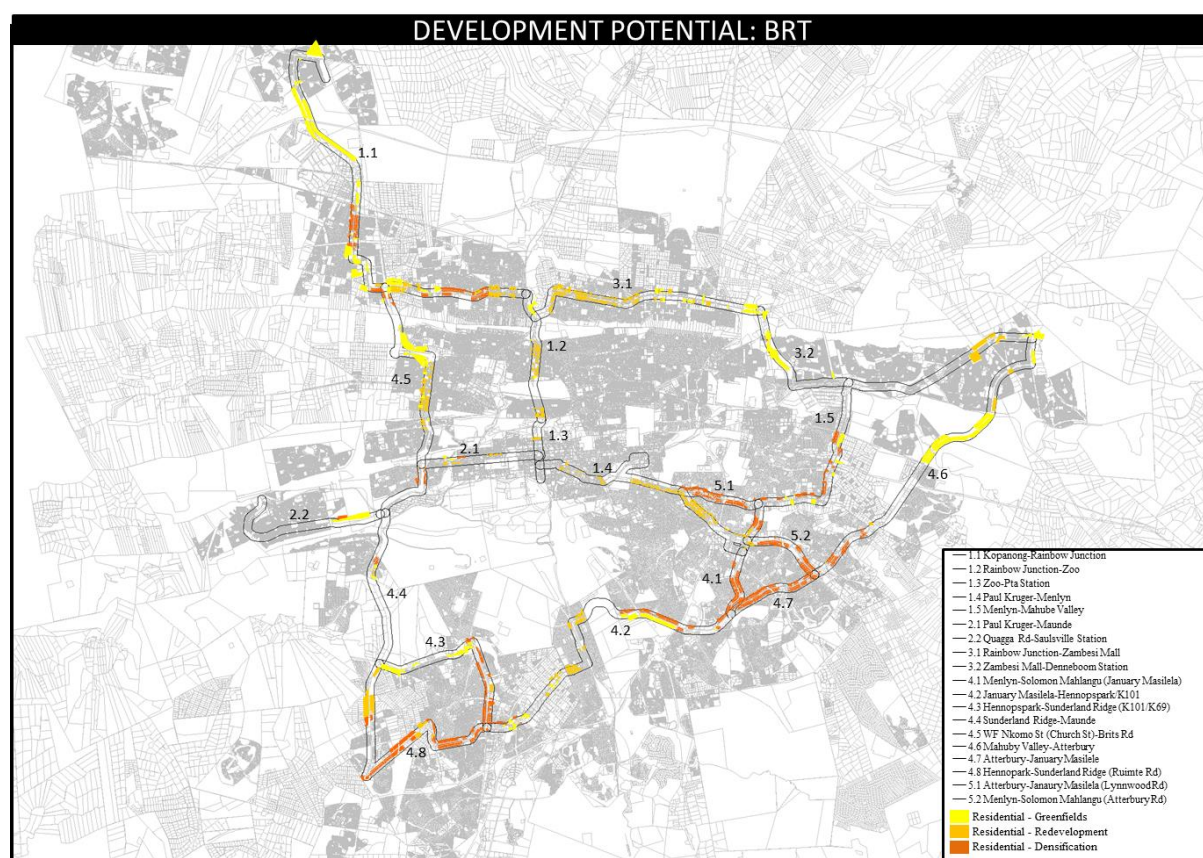
RAIL: LAND IDENTIFIED FOR DEVELOPMENT AROUND STATIONS (500 m radius)												
Rail Sections	Developable Area ha	Residential Area ha	Residential Area				Residential Units				%	Density du/ha
			High Income %	Middle Income %	Low Income %	TOTAL %	High Income	Middle Income	Low Income	TOTAL		
1. Mabopane to Daspoort	135	77	10%	32%	58%	100%	613	1 966	3 554	6 133	9%	80
2. Ga Rankuwa to Rosslyn	98	44	10%	40%	50%	100%	351	1 405	1 756	3 511	5%	80
3. Hammanskraal to Onderstepoort	46	18	20%	50%	30%	100%	296	739	444	1 478	2%	80
4. Mooka to Machielsnek (vdHoff)	164	94	10%	40%	50%	100%	750	2 999	3 748	7 497	12%	80
5. Saulsville to Rebecca	96	42	10%	10%	80%	100%	332	332	2 657	3 321	5%	80
6. Pinedene to Fountains	198	100	35%	43%	23%	100%	2 781	3 388	1 795	7 964	12%	80
7. Panpoort to Koedoespoort (Mamelodi)	253	121	10%	11%	79%	100%	972	1 077	7 667	9 715	15%	80
8. Ring Rail North (Queenswood to P Capital Park West)	473	232	16%	46%	38%	100%	3 003	8 567	6 977	18 548	29%	80
9. Ring Rail West (Hercules to Schutte)	45	26	10%	40%	50%	100%	207	826	1 033	2 066	3%	80
10. Ring Rail South (Mitchell to Hartbeespruit)	106	60	18%	48%	35%	100%	850	2 295	1 671	4 815	7%	80
TOTAL	1 613	813	16%	36%	48%	100%	10 154	23 594	31 301	65 048	100%	80

B.4.3.6.4 TRT: Residential Development Capacity

Planned TRT Network

Similar scenarios for the individual BRT route sections along the IRPTN were assessed, as depicted on Figure B-81.

Figure B-81: Development Potential: BRT



Line 1

The results for Line 1 (sections 1.1 to 1.5) are summarised in Table B.4.3-4. The total residential yield along Line 1 is estimated at approximately 53 511 units. This translates to approximately 31 067 low-income units, 9 534 units earmarked for middle income, and approximately 12 910 units for the

high-income group. In terms of individual sections it is evident that section 1.1 from Kopanong to Rainbow Junction provides the highest yield with approximately 29 020 units (of which the vast majority (more than 80%) is earmarked for the low income group).

Other sections with significant residential capacity include the Menlyn to Mahube Valley line (Line 1.5) with a potential yield of about 11 499 units of which almost 40% (4 431 units) are earmarked for low income. This line also shows extensive potential for higher income development along Lynnwood and Simon Vermooten Drives (4 556 units).

Table B.4.3-4: Line 1 Land Identified for Development along the Route (200m offset)

LINE 1: LAND IDENTIFIED FOR DEVELOPMENT ALONG THE ROUTE (200 m on both sides)												
Line 1: Sections	Developable Area ha	Residential Area ha	Residential Area			TOTAL	Residential Units				%	Density du/ha
			High Income %	Middle Income %	Low Income %		High Income	Middle Income	Low Income	TOTAL		
1.1 Kopanong -Rainbow Junction	434	363	10%	10%	80%	100%	2 902	2 902	23 216	29 020	54%	80
1.2 Rainbow Junction-Zoo	55	55	10%	33%	57%	100%	436	1 449	2 475	4 360	8%	80
1.3 Zoo-Pta Station	5	5	20%	50%	30%	100%	82	204	122	408	1%	80
1.4 Paul Kruger-Menlyn	103	103	60%	30%	10%	100%	4 934	2 467	822	8 224	15%	80
1.5 Menlyn-Mahube Valley	161	144	40%	22%	39%	100%	4 556	2 512	4 431	11 499	21%	80
TOTAL	757	669	24%	18%	58%	100%	12 910	9 534	31 067	53 511	100%	80

Line 2

Table B.4.3-5 represents the results of the land-use scenario for Line 2. This is the BRT section from the Tshwane Inner City to Atteridgeville. The results show that the area within 200m on both sides along the corridor can yield approximately 4 486 residential units. The section between Paul Kruger and Maunde Drive yields about 48% of the total with 2 160 units, and the section from Quagga Road to Saulsville Station an additional 2 326 units which represents 52% of the total. The majority part of this residential yield is for the low-income group with approximately 2 941 units (66%).

It should be noted that the section from Quagga Road to Saulsville Station utilises part of the SAPS Dog Training School which is located between Atteridgeville and Kwaggasrand, and which has been identified as a Strategic Development Area for housing development in the Tshwane Municipal Housing Development Plan (2007).

Table B.4.3-5: Line 2 Land Identified for Development along the Route (200m offset)

LINE 2: LAND IDENTIFIED FOR DEVELOPMENT ALONG THE ROUTE (200 m on both sides)															
Line 2: Sections	Developable Area	Residential Area			Residential Area	Residential Area				Residential Units					Density du/ha
		High Income	Middle Income	Low Income		High Income	Middle Income	Low Income	TOTAL	High Income	Middle Income	Low Income	TOTAL		
		ha	ha	ha		%	%	%	%						
2.1 Paul Kruger-Maunde	27	3	11	14	27	10%	40%	50%	100%	216	864	1 080	2 160	48%	80
2.2 Quagga Rd-Saulsville Station	37	3	3	23	29	10%	10%	80%	100%	233	233	1 861	2 326	52%	80
TOTAL	64	6	14	37	56	10%	24%	66%	100%	449	1 097	2 941	4 486	100%	80

Line 3

Line 3 represents the line from Rainbow Junction at Wonderboompoort to the Denneboom Station in Mamelodi. This is the north-eastern part of the Rapid Public Transit Network, which functionally

links Rosslyn/Akasia to the Mamelodi community. As illustrated in Table B.4.3-6, the total estimated residential yield for this line stands at approximately 12 644 units.

It is also clear that a large part of the residential yield is for high and middle income with 6 728 and 3 450 units respectively. There is, however, also significant potential for lower income development with a total estimated yield of about 2 466 units.

Most of the development in the Wonderboom area will be by way of residential redevelopment within the existing urban fabric, while the eastern section of the line includes extensive greenfields development.

Table B.4.3-6: Line 3 Land Identified for Development along the Route (200m offset)

LINE 3: LAND IDENTIFIED FOR DEVELOPMENT ALONG THE ROUTE (200 m on both sides)											
Line 3: Sections	Developable Area	Residential Area	Residential Area				Residential Units				Density
			High Income	Middle Income	Low Income	TOTAL	High Income	Middle Income	Low Income	TOTAL	
	ha	ha	%	%	%	%					%
3.1 Rainbow Junction-Zambesi Mall	139	137	60%	30%	10%	100%	6 557	3 278	1 093	10 928	86%
3.2 Zambesi Mall-Denneboom Station	26	21	10%	10%	80%	100%	172	172	1 373	1 717	14%
TOTAL	165	158	53%	27%	20%	100%	6 728	3 450	2 466	12 644	80

Line 4 Original

Table B.4.3-7 below illustrates the results for the Line 4 Original alignment. Line 4 can yield an estimated 34 515 residential units stretching from the existing Menlyn Node through Centurion and up to the Kirkney, Andeon and Suiderberg area in the central-western parts of the City of Tshwane. The section with the largest individual residential yield is from January Masilela to Hennops Park (section 4.2) with an estimated yield of 13 463 units. Section 4.5 between WF Nkomo Street up to the Brits Road through the Kirkney, Andeon and Suiderberg area also yields a significant number (8 166 units). Approximately 41% (14 160 units) of the residential yield along this corridor is for high income, followed by about 36% (12 404 units) for middle income, and 23% (7 951 units) for low income.

Table B.4.3-7: Line 4 (Original) Land Identified for Development along the Route (200m offset)

LINE 4 (Original): LAND IDENTIFIED FOR DEVELOPMENT ALONG THE ROUTE (200 m on both sides)											
Line 4 (Original): Sections	Developable Area	Residential Area	Residential Area				Residential Units				Density
			High Income	Middle Income	Low Income	TOTAL	High Income	Middle Income	Low Income	TOTAL	
	ha	ha	%	%	%	%					%
4.1 Menlyn-Solomon Mahlangu (January Masilela)	50	50	60%	30%	10%	100%	2 410	1 205	402	4 016	12%
4.2 January Masilela-Hennopspark / K101	178	168	60%	30%	10%	100%	8 078	4 039	1 346	13 463	39%
4.3 Hennopspark-Sunderland Ridge (K101/K69)	106	99	29%	46%	26%	100%	2 295	3 613	2 026	7 934	23%
4.4 Sunderland Ridge-Maunde	12	12	60%	30%	10%	100%	562	281	94	936	3%
4.5 WF Nkomo St (Church St)-Brits Rd	135	102	10%	40%	50%	100%	817	3 267	4 083	8 166	24%
TOTAL	481	431	41%	36%	23%	100%	14 160	12 404	7 951	34 515	80

Line 4 Alternative

The Line 4 Alternative can yield significantly more residential units than Line 4 Original as illustrated on Table B.4.3-8 below. Line 4 Alternative yields about 54 383 units which is about 20 000 more than

the yield of Line 4 Original. Section 4.2, 4.4 and 4.5 are the same for both alternatives, but sections 4.6 and 4.7 add additional capacity to Line 4 Alternative. Section 4.6 yields about 11 939 units (the section between Mahube Valley and Atterbury Road) while section 4.7 from Atterbury Road to January Masilela can yield about 5 840 units.

Similarly, section 4.8 through the Hennops Park area up to Sunderland Ridge can yield about 14 039 units compared to the 7 934 units which section 4.3 yields under the Line 4 Original scenario.

It is thus evident that Line 4 Alternative adds about 20 000 more residential units than Line 4 Original.

Table B.4.3-8: Line 4 (Alternative) Land Identified for Development along the Route (200m offset)

LINE 4 (Alternative): LAND IDENTIFIED FOR DEVELOPMENT ALONG THE ROUTE (200 m on both sides)												
Line 4 (Alternative): Sections	Developable Area	Residential Area	Residential Area				Residential Units					Density
			High Income	Middle Income	Low Income	TOTAL	High Income	Middle Income	Low Income	TOTAL		
	ha	ha	%	%	%	%	High Income	Middle Income	Low Income	TOTAL	%	du/ha
4.6 Mahube Valley-Atterbury	174	149	60%	30%	10%	100%	7 164	3 582	1 194	11 939	22%	80
4.7 Atterbury-January Masilela	73	73	60%	30%	10%	100%	3 504	1 752	584	5 840	11%	80
4.2 January Masilela-Hennospark / K101	178	168	60%	30%	10%	100%	8 078	4 039	1 346	13 463	25%	80
4.8 Hennospark-Sunderland Ridge (Ruimte Rd)	202	175	60%	30%	10%	100%	8 423	4 212	1 404	14 039	26%	80
4.4 Sunderland Ridge-Maunde	12	12	60%	30%	10%	100%	562	281	94	936	2%	80
4.5 Wf Nkomo St (Church St)-Brits Rd	135	102	10%	40%	50%	100%	817	3 267	4 083	8 166	15%	80
TOTAL	774	680	52%	32%	16%	100%	28 547	17 132	8 705	54 383	100%	80

Line 5

The last section (Line 5) represents the short sections of Lynnwood Road and Atterbury Road respectively. Both these sections could yield an estimated 4 000 residential units each to bring the total yield to about 8 504 units. The majority (60%) is earmarked for high income, 30% for the middle-income, and 10% for the low-income residential market.

Table B.4.3-9: Line 5 Land Identified for Development along the Route (200m offset)

LINKS: LAND IDENTIFIED FOR DEVELOPMENT ALONG THE ROUTE (200 m on both sides)												
Links: Sections	Developable Area	Residential Area	Residential Area				Residential Units				%	Density du/ha
			High Income	Middle Income	Low Income	TOTAL	High Income	Middle Income	Low Income	TOTAL		
	ha	ha	%	%	%	%						
5.1 Atterbury-January Masilela (Lynnwood Rd)	51	51	60%	30%	10%	100%	2 424	1 212	404	4 040	48%	80
5.2 Menlyn-Solomon Mahlangu (Atterbury Rd)	56	56	60%	30%	10%	100%	2 678	1 339	446	4 464	52%	80
TOTAL	106	106	60%	30%	10%	100%	5 102	2 551	850	8 504	100%	80

B.4.3.6.5 Summary: Total Development Capacity

Table B.4.3-10 summarises the total residential yield along the entire Integrated Rapid Public Transport Network (rail and the BRT lines). The total potential residential yield along the IRPT Network (with Line 4 Original) stands at about 178 708 residential units.

This comprises about 49 503 units (28%) for high income, 52 629 units (29%) for middle income, and 76 575 units (43%) of the total yield for low income. In the Line 4 Alternative scenario the total yield increases by approximately 20 000 units to 198 577 units. Under this scenario, the high income yield

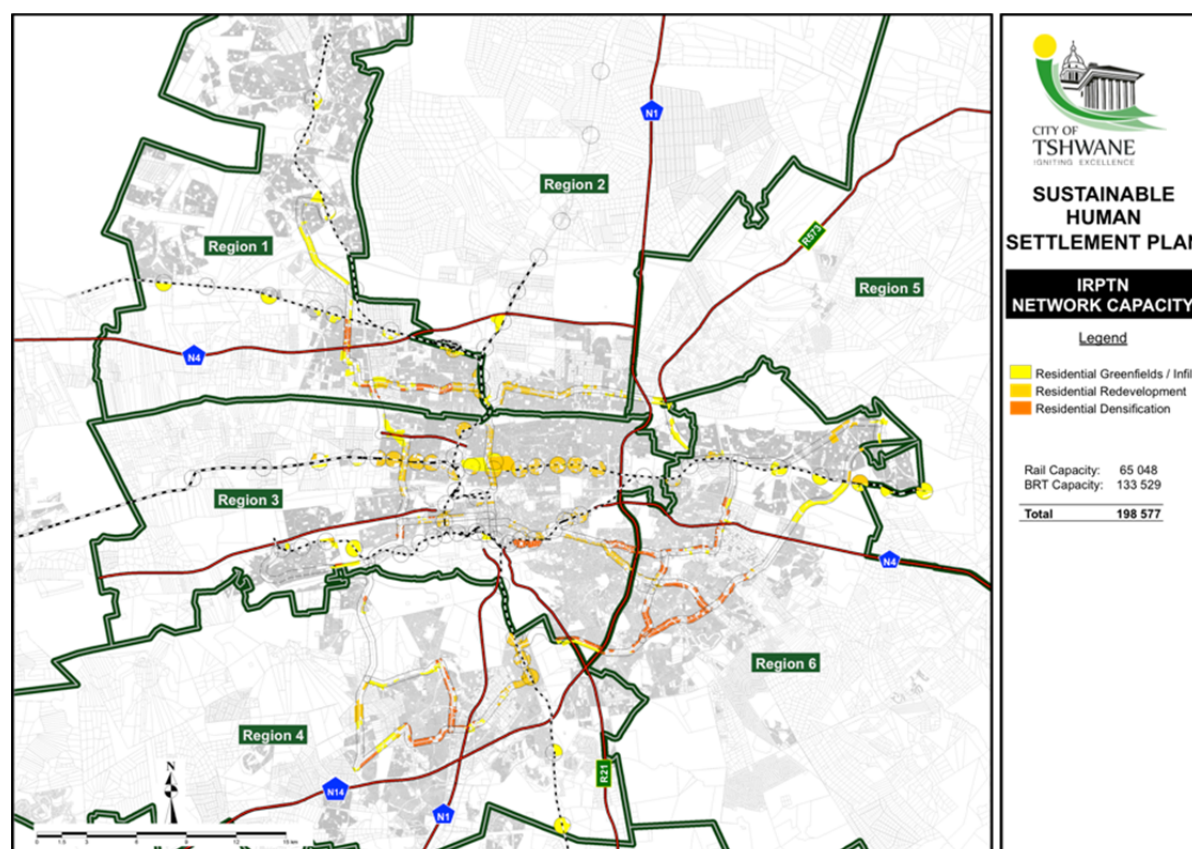
is a little higher at 32% with a yield of 63 890 units, while the lower income portion drops to 29% of the total, although the total low income yield increases from 76 575 to 77 330 units.

In terms of the Original scenario the railway section of the IRPT Network yields between 33% and 36% of the total residential capacity, depending on which of the Line 4 alternatives is used.

Table B.4.3-10: IRPTN - Total Residential Development Potential

IRPTN: DEVELOPABLE LAND (Stations and Lines)																
IRPTN NETWORK	Developable Area ha	Residential Area			Residential Area ha	Residential Area				TOTAL	Residential Units				% Original	% Alternative
		High Income ha	Middle Income ha	Low Income ha		High Income %	Middle Income %	Low Income %	High Income		Middle Income	Low Income	TOTAL			
Rail	1 613	127	295	391	813	16%	36%	48%	100%	10 154	23 594	31 301	65 048	36%	33%	
Line 1	757	161	119	388	669	24%	18%	58%	100%	12 910	9 534	31 067	53 511	30%	27%	
Line 2	64	6	14	37	56	10%	24%	66%	100%	449	1 097	2 941	4 486	3%	2%	
Line 3	165	84	43	31	158	53%	27%	20%	100%	6 728	3 450	2 466	12 644	7%	6%	
Line 4 Original	481	177	155	99	431	41%	36%	23%	100%	14 160	12 404	7 951	34 515	19%		
Line 4 Alternative	774	357	214	109	680	52%	32%	16%	100%	28 547	17 132	8 705	54 383		27%	
Links	106	64	32	11	106	60%	30%	10%	100%	5 102	2 551	850	8 504	5%	4%	
TOTAL Original	3 187	619	658	957	2 234	28%	29%	43%	100%	49 503	52 629	76 575	178 708	100%		
TOTAL Alternative	3 479	799	717	967	2 482	32%	29%	39%	100%	63 890	57 357	77 330	198 577		100%	

Figure B-39: Residential Densification along IRPTN Corridors



B.4.3.6.6 Alternative Density and Catchment Area Scenarios

Additional scenarios were additionally assessed as part of the corridor analysis:

- Scenario 2: If the net density is increased to 160 units per hectare (3-storey walk-up housing typologies) along the IRPT Network, the residential yields could increase from approximately 178 000 units to about 357 000 units (Scenario 2).
- Scenario 3: If the geographic area is increased to 400m on both sides of the IRPT Network, but the net density remains at 80 units/ha, the residential yield along the Rapid Transit Network increases from 178 708 to approximately 292 368 units. The potential benefits (increased number of residential units) along the Rapid Transit Network are higher if the densities are increased, than if the area utilised for densification is increased.
- Scenario 4: If the combined impact of increased densities and larger catchment areas around the Rapid Transit Network is considered, the total yield from the original 178 708 units increases to approximately 584 735 units, or to 664 210 units for the Alternative alignment.

These figures have to be interpreted against the backdrop of the existing housing demand and the projected future demand for housing in the City of Tshwane

This shows that the estimated potential residential increase in the City of Tshwane between 2011 and 2037 stands at about 635 835 units. If the 2009 informal settlement backlog of 145 047 units and the backyard backlog of 83 378 units are added, it brings the total dwelling unit need up to 2037 to about 864 260 units.

The IRPTN Scenario 1 yielded about 178 708 units which shows that there will then still be a deficit of about 685 552 units. It also shows the deficit in terms of high, medium and low income individually. The deficit decreases if the densities are increased (Scenario 2) or if the catchment area around the IRPTN is increased (Scenario 3). Even when both the densities and the catchment areas are increased (Scenario 4), there is still a deficit in terms of the projected housing demand (all income groups) in the City up to 2037. This indicates that more areas need to be earmarked for infill development or densification, or the urban footprint of the City will have to be increased to cater for the demand.

It is therefore evident that the total deficit can decrease from 685 552 units to about 279 525 units if scenario 4, which anticipates a more intense redevelopment over a larger area, is implemented.

Table B.4.3-11: Summary – Residential Dwelling Units Required

SUMMARY				
DWELLING UNIT NEED				
Household Income per Month	NUMBER OF UNITS			
	High Income	Medium Income	Low Income	Total
	R12 817 +	R3184 - R12 817	R0 -R3183	
Incremental growth (2011-2037)	325 718	216 890	93 227	635 835
Backlog				
Informal (2009)			145047	145047
Backyard (2009)			83378	83378
TOTAL	325 718	216 890	321 652	864 260
%	38%	25%	37%	100%
IRPTN MODEL YIELD				
Household Income per Month	NUMBER OF UNITS			
	High Income	Medium Income	Low Income	Total
	R12 817 +	R3184 - R12 817	R0 -R3183	
SCENARIO 1: Base Case	49 503	52 629	76 575	178 708
% of Need	15%	24%	24%	21%
SCENARIO 2: 3 Storey Walk - Ups	99 007	105 258	153 151	357 416
% of Need	30%	49%	48%	41%
SCENARIO 3: Doubling of Line Area (500 m radius and 400 m on both sides)	88 852	81 665	121 850	292 368
% of Need	27%	38%	38%	34%
SCENARIO 4: 3 Storey Walk - Ups and Doubling of Line Area	177 705	163 329	243 701	584 735
% of Need	55%	75%	76%	68%
SURPLUS/DEFICIT				
Household Income per Month	NUMBER OF UNITS			
	High Income	Medium Income	Low Income	Total
	R12 817 +	R3184 - R12 817	R0 -R3183	
SCENARIO 1: Base Case	-276 214	-164 261	-245 077	-685 552
SCENARIO 2: 3 Storey Walk - Ups	-226 711	-111 632	-168 501	-506 844
SCENARIO 3: Doubling of Line Area	-236 865	-135 226	-199 802	-571 892
SCENARIO 4: 3 Storey Walk - Ups and Doubling of Line Area	-148 013	-53 561	-77 951	-279 525

B.4.3.7 Intervention Programme – Total Expected Low Income Housing Supply

With consideration of all its components, the intervention programme intends to supply a total of 149 377 low-income residential units. It should be noted that this considers the base case IRPTN densification scenario, for low income housing only, including the alternative alignment for TRT Line 4.

Figure B-83: Intervention Programme Housing Supply

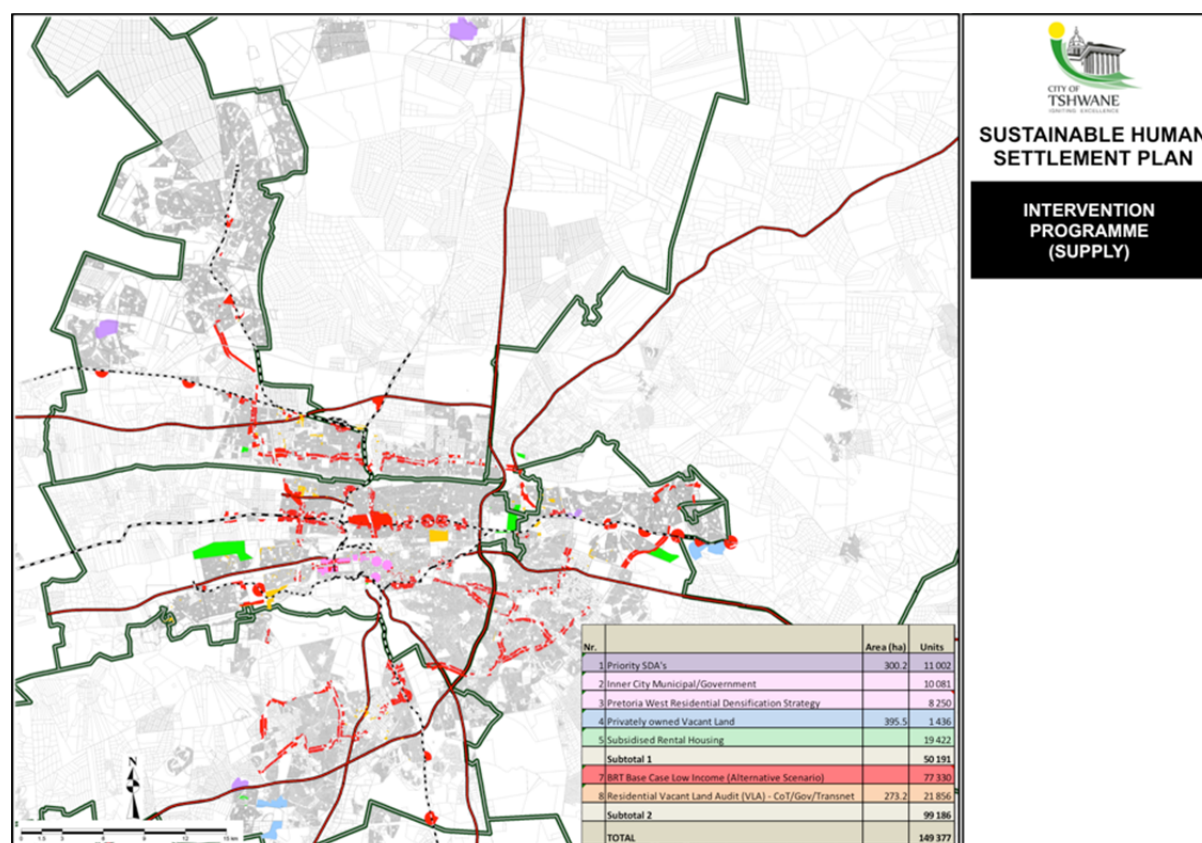


Table B.4.3-12: Intervention Programme Housing Supply

Nr.		Area (ha)	Units	Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7	TOTAL	Private Sector Units
1	Priority SDA's	300.2	11 002	3 906	5 200		1 200		696		11 002	
2	Inner City Municipal/Government		10 081			10 081					10 081	21 087
3	Pretoria West Residential Densification Strategy		8 250			8 250					8 250	
4	Privately owned Vacant Land	395.5	1 436				1 134	302			1 436	
5	Subsidised Rental Housing		19 422	1 241		12 889	1 525	2 686	550	531	19 422	
	Subtotal 1		50 191	5 147	5 200	31 220	3 859	2 988	1 246	531	50 191	21 087
7	BRT Base Case Low Income (Alternative Scenario)		77 330	27 987	2 004	27 120	4 049	3 010	13 160	-	77 330	121 247
8	Residential Vacant Land Audit (VLA) - CoT/Gov/Transnet	273.2	21 856	1 954	170	12 966	2 101	1 492	3 173	-	21 856	49 621
	Subtotal 2		99 186	29 941	2 174	40 086	6 150	4 501	16 333	-	99 186	170 868
	TOTAL		149 377	35 088	7 374	71 306	10 009	7 489	17 579	531	149 377	191 955

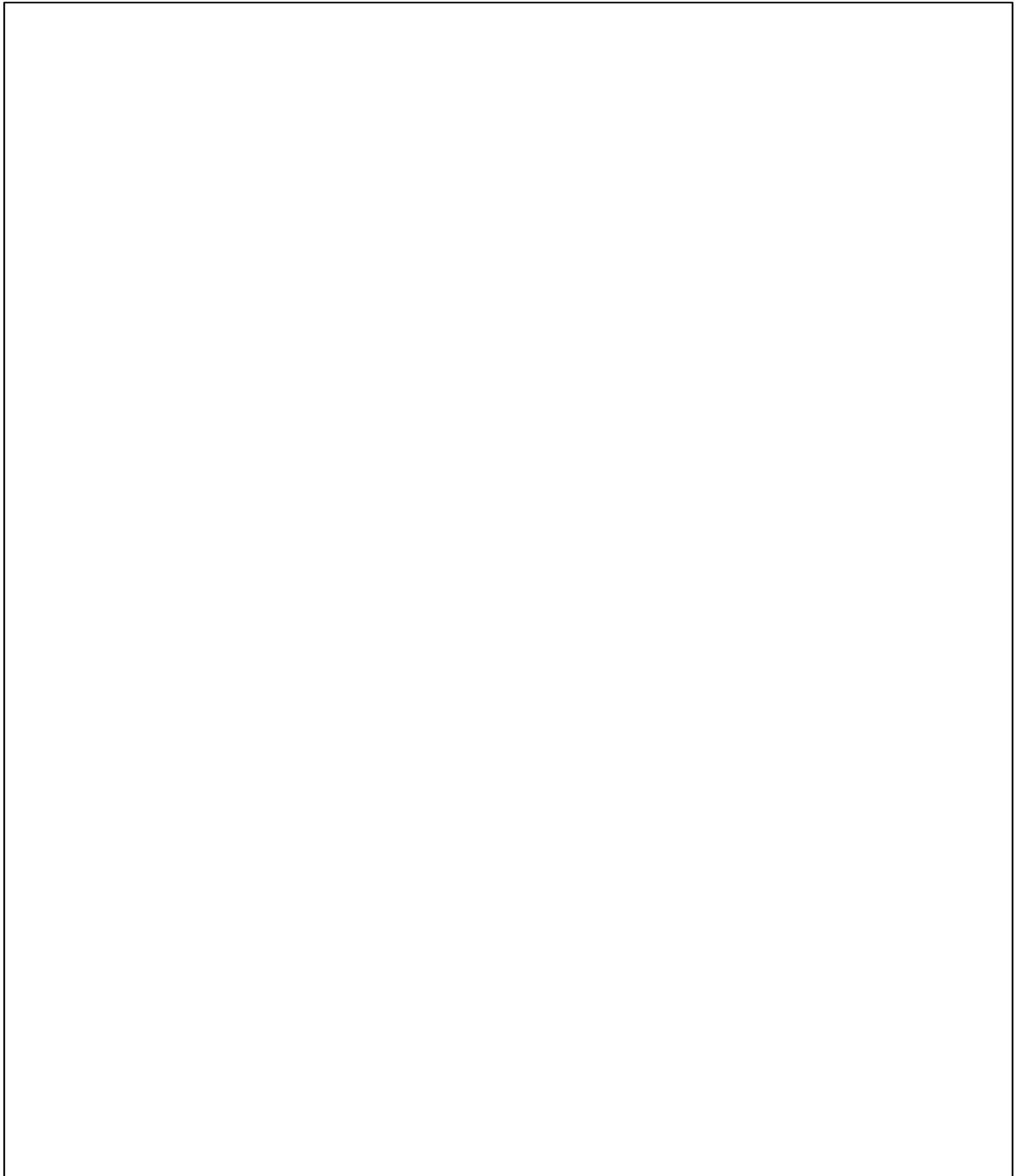
B.4.4 Total Housing Supply

With consideration of the housing supply for both the consolidation and intervention programmes, a total housing supply of 332 814 residential units may be achieved (Refer to Table B.4.4-1). This total accommodates approximately 85% of the current low income-housing backlog.

Table B.4.4-1: Total Housing Supply

INITIATIVE/PROGRAMME	UNITS	
- Upgrading of Informal Settlement Strategy	183 437	Consolidation Programme
- Priority SDA's	11 002	Intervention Programme
- Inner City (CoT/Gov)	10 081	
- Pretoria West Residential Densification	8 250	
- Privately owned Vacant Land	1 436	
- Subsidised Rental Housing	19 422	
- BRT Base Case Low Income (Alt. sc)	77 330	
- Residential VLA -CoT/Gov/Transnet	21 856	
Subtotal	149 377	
TOTAL	332 814	

B.5 Trends and Demand for Community and Social Infrastructure



B.5.1 Health and Social Development

B.5.1.1 Health and social development facilities

The wellbeing of a society – the state of its human development – is partially measured by the extent to which all its citizens enjoy good health, education, shelter and other life amenities that are generally regarded as social services.

In line with Tshwane Vision 2055, the three main focus areas include some concerted efforts towards zero deprivation, scaling up of early childhood development and the reduction of the burden of disease. According to the Gauteng Social Development Strategy, Social Development is about maximizing the capacity of the individual, the family or household and the community to participate productively in society, both socially and economically.

Social Development is about achieving the optimum potential of people for self-actualisation, without prejudice of any form. This can be achieved by facilitating optimisation of people's welfare, job and opportunity creation, and adequate functionality in social relationships at individual, family, community level, and access to social grants. It involves the mobilization of community development and empowerment. Central to the whole notion of Social Development is the Social Infrastructure Development.

Although it is an established fact that the provision of Primary Health Services is the competency of Province, City of Tshwane has over the years delivered this service on an agency basis. This had the effect that both Gauteng Provincial Government and City of Tshwane were providing the same service to people of Tshwane to an extent that there are about 22 clinics built and managed by the City and there are those built and managed by the Province within the Tshwane (about 88 health facilities) . The latter had in turn provided subsidy to the former. The backlog to date involves about 15 Health Facilities.

The provision of Social Services is the shared function of all three tiers of Government. The City has a dedicated division providing Social Services including provision of Early Childhood Development, Care for the Aged and services to other vulnerable groups such as Youth, women and people with disability. To this extend, social infrastructure such as Early Childhood Development Centres, Multi-purpose Centres, and Transitional Centres for the homelessness. Currently the City is managing about 10 crèches with the potential for accommodating 1200 children from disadvantaged communities per year. The City has just approved a report on the initiatives to alleviate the problem of homelessness in the City. This report calls for amongst other interventions the revamping of 3

buildings within region 3 as well the construction of one Transitional Centre for the homelessness in each of the remaining 6 regions.

B.5.1.1.1 Provincial and National Commitments

The provincial and national government have committed to assist with the following projects:

- Social development Centre in Hammanskraal 2013/14 financial year GP Social Infrastructure grant

B.5.1.1.2 District Health Facility Backlogs

The current distric health facility backlogs are summarised in Table B.5.1-1 below.

Table B.5.1-1: District Health Facility Backlogs

UPGRADING AND THE EXTENSION OF THE FOLLOWING FACILITIES ARE URGENT	WARD	REGION	TOWNSHIP	BUDGET REQUIREMENTS
Extension Saulsville Clinic	62	3	Saulsville	R30,000,000
Extension Majaneng clinic to a CHC (Kekanastad) *	76	1	Kekanastad	R30,000,000
Extension Atteridgeville to a CHC and build new MOU	62	3	Atteridgeville	R30,000,000
Extension Mamelodi Clinic	28	6	Mamelodi	R30,000,000
Extension Nellmapius	40	6	Nellmapius	R30,000,000
Extension Phagameng	18	6	Mamelodi East	R30,000,000
Extension Silverton	41	6	Silverton	R30,000,000
Extension Diloppe Clinic *	8	2	Hammanskraal	R30,000,000
Replacement Pretorius park	25	6	Pretoriuspark	R30,000,000
Extension KT Matubatse with a MOU and Emergency **	37	2	Soshanguve	R30,000,000
Extend Stanza Bopape CHC with examination rooms *	15	5	Mamelodi east	R30,000,000
Replacement of Tlamelong Clinic with a CHC *	21	1	Mabopane	R30,000,000
New Sunnyside-Arcadia Clinic/CHC	58	3	Pretoria Central	R30,000,000
New Clinic PTA_North	2 *	1	Pretoria North	R30,000,000
New Olievenhoutbosch	48	4	Olievenhoutbosch	R30,000,000
New Clinic Block P	27	2	Soshanguve	R30,000,000
New Clinic in Block JJ	11	1	Soshanguve	R30,000,000
Extention of Rooihuiskraal Clinic	64	6	Rooihuiskraal	R30,000,000
Replacement of Rosslyn Clinic	4	1	Rosslyn	R30,000,000
New Clinic in Lusaka		6	Mamelodi	R30,000,000
Extension of Karenpark Clinic	4	1	Karenpark	R30,000,000
New clinic Moot		2	Moot	R30,000,000
New digital mobile x-ray unit		1-7	City wide	R5,000,000
Animal impounding station in the Northern area				R50,000,000

B.5.1.1.3 Social Development Centres Backlogs

The current social development centres backlogs are summarised in Table B.5.1-2 below.

Table B.5.1-2: Social Development Centres Backlog

UPGRADING AND THE EXTENSION OF THE FOLLOWING FACILITIES ARE URGENT	WARD	REGION	TOWNSHIP	BUDGET REQUIREMENTS
Multipurpose Development Centres		Region 1-7		R50,000,000 per center
Centre for Homelessness		Region 1-7		R50,000,000 per center

B.5.1.2 Sport and Recreation Services

B.5.1.2.1 Provincial and National Commitments

The provincial and national government have committed to assist with the following projects:

- Olievenhoutbosch Community library 2014/14 financial year GP SACR
- Sokhulum Community library 2015/16 financial year GP SACR
- Outdoor Gym 2013/14 financial year National South Africa Sport Department
- Solomon Mahlangu Freedom square 2013/14/15 financial year National Treasury under NDPG/Tsosoloso Project

B.5.1.3 Backlogs in provision of libraries, sport & recreation and arts & crafts facilities

B.5.1.3.1 Library backlogs

The backlogs in terms of provision of library facilities are summarised per region in the table below.

Table B.5.1-3: Backlogs in provision of Library Facilities

		MTREF		BACKLOGS		
Region	# Existing facilities:	MTREF funded library projects:	MTREF Budget allocation:	Backlogs not funded:	Budget requirements:	Projected implementation period:
1	8	-	-	Ga-Rankuwa Library Akasia Library New Mabopane Library	R 17,000,000 R 18,000,000 R 18,000,000	2015/16 – 2016/17 2016/17 – 2017/18 2016/17 – 2017/18
2	3	Suurman Library	R 15,000,000	New Eersterust Library Overkruin Library	R 18,000,000 R 19,000,000	2016/17 – 2017/18 2018/19 – 2019/20
3	13	-	-	New Atteridgeville Library Lotus Gardens Library Mayville Library	R 17,000,000 R 18,000,000 R 19,000,000 R 19,000,000	2015/16 – 2016/17 2017/18 – 2018/19 2018/19 – 2019/20 2018/19 – 2019/20

				Mountain View Library		
4	8	Olievenhoutbosch Library (Gauteng)	R 10,000,000	Valhalla Library Erasmia Library	R 19,000,000 R 19,000,000	2018/19 – 2019/20 2018/19 – 2019/20
5	5	Cullinan Library Park	R 20 000,000	Kameeldrift Library and Rayton Library	R 5,000,000	2015/16
6	10	-	-	Mamelodi (Lusaka) Library	R 18,000,000	2017/18 – 2018/19
7	6	-	-	Ekgangala Library	R 17,000,000	2015/16 – 2016/17
	51	R 45 000 000			R 241 000 000	

B.5.1.3.2 Sport and recreation facility backlogs

The backlogs in terms of provision of sport and recreation facilities are summarised per region in the table below.

Table B.5.1-4: Backlogs in provision of Sport and Recreation Facilities

		MTREF		BACKLOGS		
Region	# Existing facilities:	MTREF funded projects:	MTREF Budget allocation:	Backlogs not funded:	Budget requirements:	Projected implementation period:
1	26	Soshanguve Giant Stadium	R 290,000,000	ODI Stadium Klipkruisfontein multi-purpose centre Ga-Rankuwa Stadium upgrade	R 90,000,000 R 30,000,000 R 40,000,000	2016/17 – 2017/18 2016/17 – 2017/18 2017/18 – 2018/19
2	12	Hammanskraal multi-purpose centre	R 25,000,000	Hammanskraal Indoor Centre New Eersterust/Stinkwater multi-purpose centre	R 50,000,000 R 20,000,000	2015/16 – 2016/17 2015/16 – 2016/17
3	24	Lotus Gardens multi-purpose centre Upgrading of Pilditch Stadium	R 24,000,000 R 1,000,000	Upgrade Caledonian Stadium Lotus Gardens multi-purpose centre Upgrading of Pilditch Stadium	R 30,000,000 R 35,000,000 R 30,000,000	2018/19 – 2019/20 2015/16 – 2016/17 2015/16 – 2016/17
4	2	Olievenhoutbosch multi-purpose centre	R 18,500,000	Olievenhoutbosch multi-purpose hall	R 50,000,000	2016/17 – 2017/18
5	6	Refilwe Stadium	R 40,000,000	-	-	-
6	26	H.M. Pitje Stadium	R 6,465,000	H.M Pitje Stadium	R 160,000,000	2017/18 – 2018/19

7	6	Zithobeni Stadium	R 60,000,000	Ekangala Stadium upgrade	R 40,000,000	2018/19 – 2019/20
All	450	Greening of Sports fields	62,000,000	Greening of Sports fields	R 130,000,000	2015/16 – 20/18
	51	R 526,965,000			R 705,000,000	

B.5.1.3.3 Arts and crafts facility backlogs

The backlogs in terms of provision of arts and crafts facilities are summarised per region in the table below.

Table B.5.1-5: Backlogs in provision of Arts and Craft Facilities

		MTREF		BACKLOGS		
Region	# Existing facilities:	MTREF funded projects:	MTREF Budget allocation:	Backlogs not funded:	Budget requirements:	Projected implementation period:
1	2	-	-	Soshanguve Culture Centre	R 30,000,000	2016/17 – 2017/18
2	2	-	-	Hammanskraal Cultural Centre	R 40,000,000	2018/19 – 2019/20
3	6	Restoration of City Hall organ (EM Office budget)	15,000,000	Lotus Gardens multi-purpose hall Upgrading of museums Upgrade Saulsville Arena	R 17,000,000 R 10,000,000 R 5,000,000	2015/16 – 2016/17 2015/16 2015/16
4	2	-	-	Olievenhoutbosch multi-purpose hall	R 17,000,000	2017/18 – 2018/19
5	2	Cullinan Library Park (Amphitheatre)	R 1,668,000.00 (Of project budget)	-	-	-
6	0	Solomon Mahlangu Freedom Square (Tsosoloso funded)	R 60,000,000	-	-	-
7	1	-	-	-	-	-
	51	R 76,688,000			R 119,000,000	

B.5.1.3.4 Summary of total backlog for all Sport & Recreation facilities

The total backlogs in for social recreation facilities are summarised in Table B.5.1-6.

Table B.5.1-6: Summary of total backlog for all Library, Sport & Recreation, Arts & Crafts Facilities

Function	2015/16 – 2016/17	2016/17 – 2017/18	2017/18 – 2018/19	2018/19 – 2019/20	TOTAL
Libraries	56,000,000	54,000,000	36,000,000	95,000,000	241,000,000
Culture	49,000,000	30,000,000	17,000,000	40,000,000	119,000,000
Sport	215,000,000	170,000,000	200,000,000	70,000,000	655,000,000
Greening	25,000,000	30,000,000	35,000,000	40,000,000	130,000,000
Total	195,000,000	274,000,000	273,000,000	225,000,000	1,145,000,000

B.5.1.3.5 Maintenance backlog for all Sport & Recreation facilities

The sport and recreation facility maintenance backlog is provided in Table B.5.1-7.

- The 2014/15 annual Operational Budget allocation towards the Repairs and Maintenance of Sport & Recreation facilities to all 7 Regions was **R 19,316,450**. This allocation constituted a 32% reduction from the 2013/14 financial year which amounts to **R 28,743,763**. The estimated maintenance backlog is **R 232,637,611** for all 7 regions.
- The condition of all Sport & Recreation facilities deteriorate annually due to a lack of adequate maintenance funds. At the current rate it will take many years to reach the desired condition for all facilities.
- The scientific needs assessment done for the maintenance of Sport & Recreation facilities has to inform the allocation of opex funding awarded to the Regions.
- Future capex infrastructure establishment should not materialise unless operational funds are available.

Table B.5.1-7: Sport and recreation facilities maintenance backlog

Region:	Backlog estimate:
Region 1:	27,022,560.65
Region 2:	11,646,587.26
Region 3:	120,548,908.01
Region 4:	10,886,804.98
Region 5:	17,368,761.31
Region 6:	29,446,794.93
Region 7:	15,717,194.28
TOTAL:	232,637,611.42

B.6 Trends and Demand for Transportation

BEPP Content Guidelines – as per BEPP Guidance Note 2015/16-2017/18

This section of the BEPP should seek to:



- Unpack the trends in demand for transport services by mode and income group.
- Categorise the trends for transport demand by average trip lengths, average travel time, average travel cost, transport reliability and transport safety.

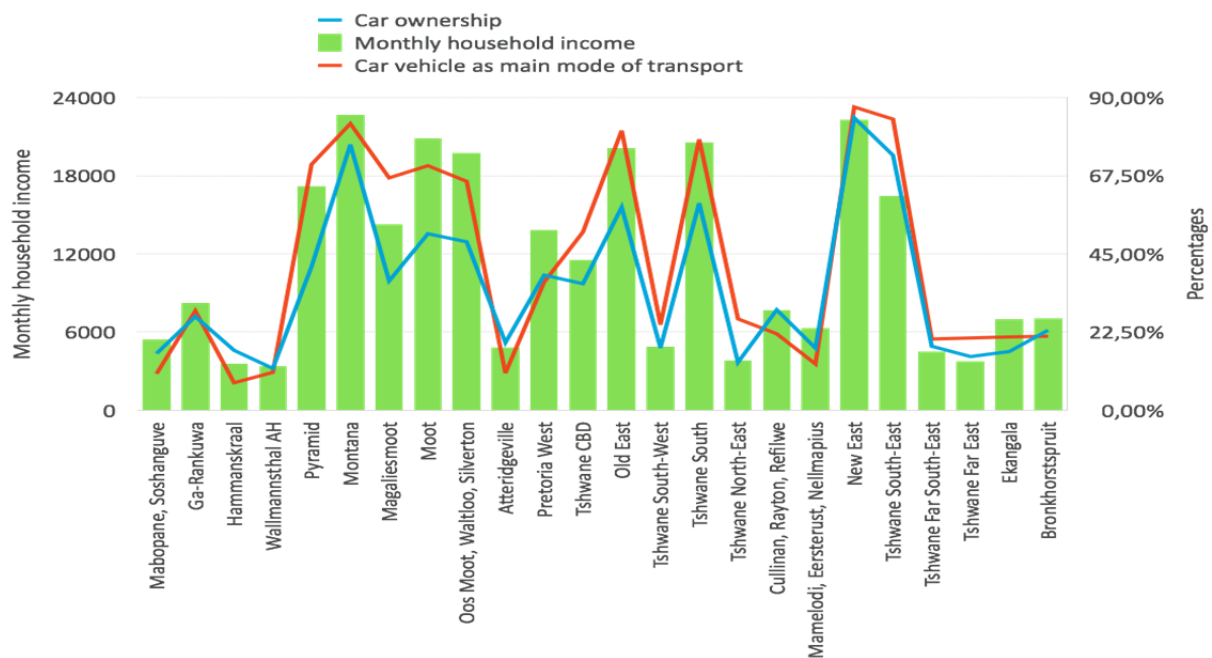
B.6.1 Transportation Profile Analysis

The trends in demand for transport were sourced from the Tshwane Household Travel Survey, which was conducted during 2013 (Household Travel Survey Draft Technical Report 2013, City of Tshwane).

This report indicates that there is a direct relationship between income levels, car ownership and main mode of travel within Tshwane. As mean monthly household income increases in an area, so does the household car ownership and incidence of car travel as main mode of transport. In the same way, as income levels and car ownership decrease, so does the utilisation of public transport. The more affluent areas such as Montana, Tshwane South-East and the New East have high levels of car ownership and utilisation of cars as the main mode of transport, as shown in Figure B-84. Similarly, the lower income areas such as Hammanskraal, Wallmannsthal and Tshwane Far-East have lower car ownership rates and usage of cars as main modes of transport.

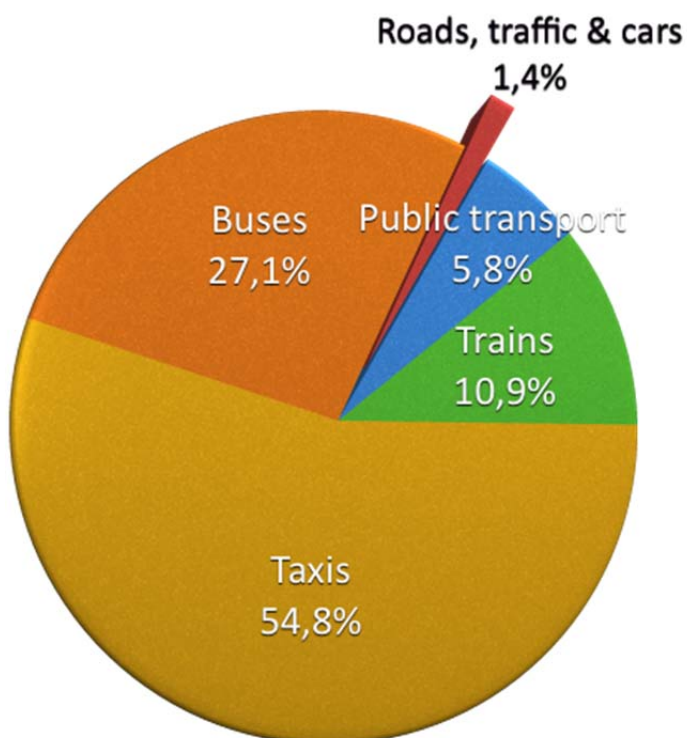
The types of transport problems experienced in Tshwane overall appear to be overwhelmingly related to public transport, with only 1.4% of problems relating to roads or cars and traffic. The majority (54.8%) of transport problems experienced are related to minibus taxis, however it is important to note that the majority of public transport travel is by minibus taxi. The main problems experienced with public transport are the availability thereof (38.8%) and the cost thereof (28.3%). The safety of public transport services comes in only fourth as a point of concern (Refer to Figure B-85 and Figure B-86 below).

Figure B-84: Mean monthly income versus car ownership and car as main mode of transport



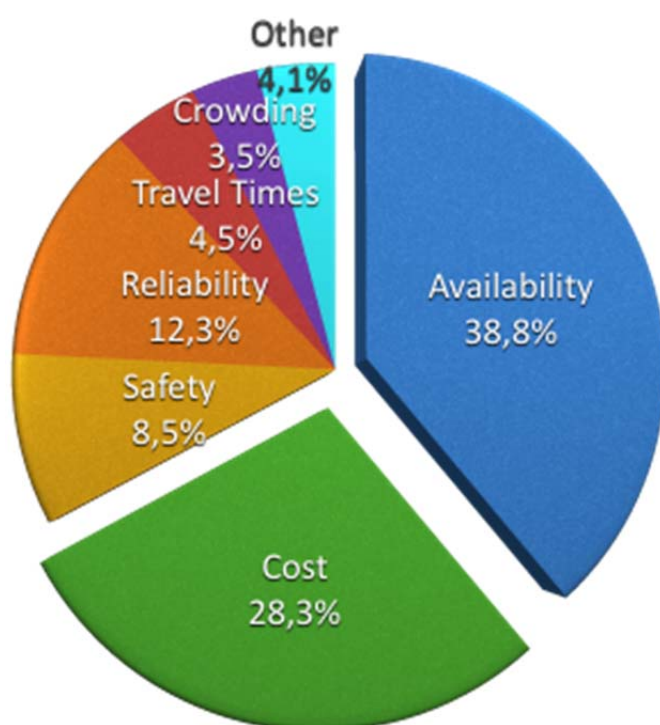
Source: Household Travel Survey Draft Technical Report, City of Tshwane (2013)

Figure B-85: Tshwane transport problems experienced by mode



Source: Household Travel Survey Draft Technical Report, City of Tshwane (2013)

Figure B-86: Problems experienced with public transport



Source: Household Travel Survey Draft Technical Report, City of Tshwane (2013)

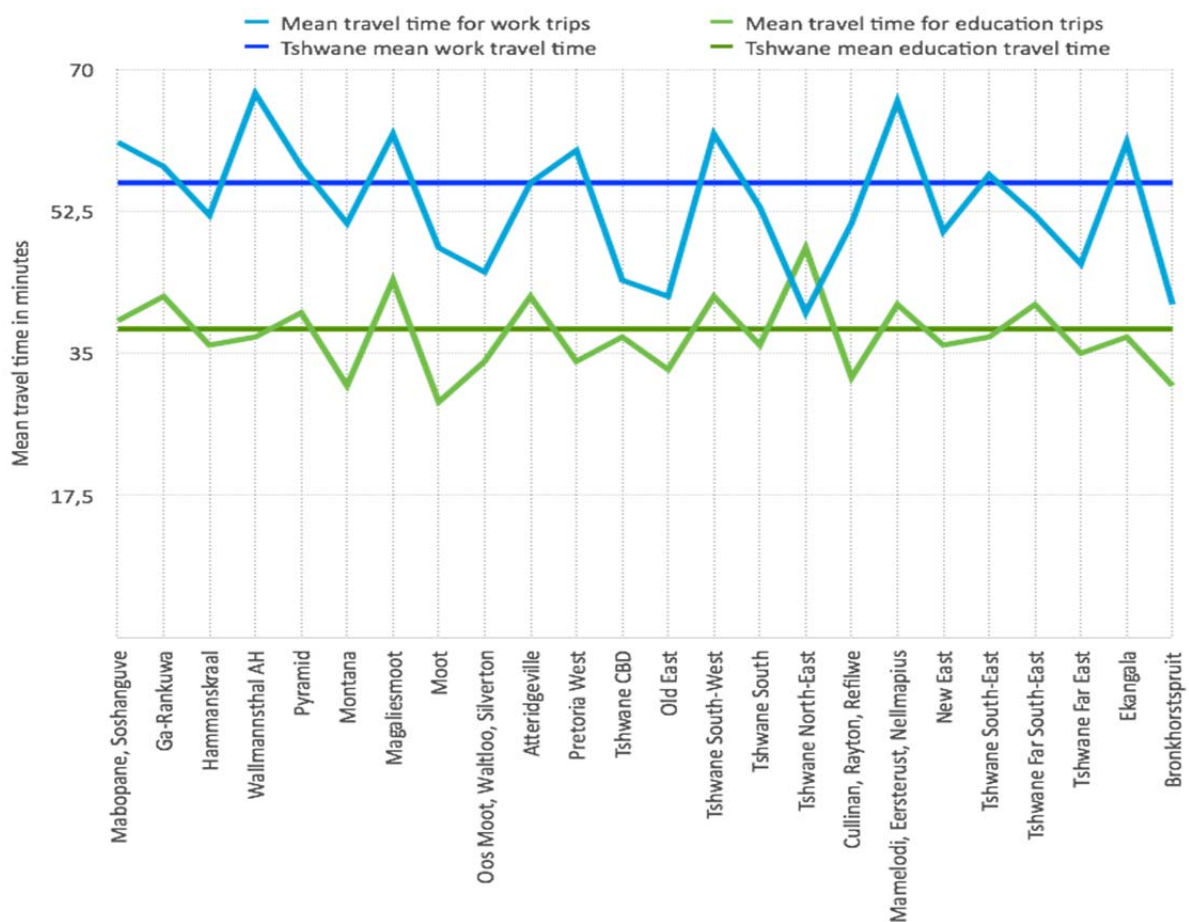
The mean travel time experienced by Tshwane residents is 50 minutes. Looking into travel times in more detail, the HTS data tells us that the mean travel time to work is much higher than that to education destinations, at 56 minutes and 38 minutes respectively. This could be attributed to the lack of work opportunities within the residential areas in Tshwane i.e. residents are forced to work in areas outside their area of residence. In areas like the Tshwane CBD, the Old East and Oos Moot/ Waltloo/ Silverton there is a mix of residential and business land uses; this means that people can both live and work in the same area and as a result their travel times to work are lower than the mean at 44 minutes. In rural and low-density areas such as Wallmannsthal and Ekangala work opportunities are located further away, for example in the CBD or suburbs of Tshwane, and this may be the reason that travel times are generally higher than the mean at 67 and 61 minutes respectively. Traditionally residential areas which were deliberately located away from the City, such as Mamelodi/ Nellmapius/ Eersterust, Ga-rankuwa and Soshunguve have few work opportunities within the area and so their travel times are above the Tshwane mean at 66, 58 and 61 minutes respectively.

Generally, learners will be able to attend school within the same area that they live, hence the lower overall travel times; for this reason learners are often able to travel to school on foot (Refer to Figure B-87).

Modes of travel that take the longest are train and bus at 81 minutes and 76 minutes, average, respectively. The HTS data points to the long travel times train users experience being a result of proportionally high walking, waiting and transfer times during the journey. This is likely as a result of a low proportion of rail users living and working near stations, and irregular train services. The same HTS data points to waiting and in-vehicle time being the highest proportion of bus travel times; this could be attributable to irregular bus services and indirect journeys with multiple pick up locations.

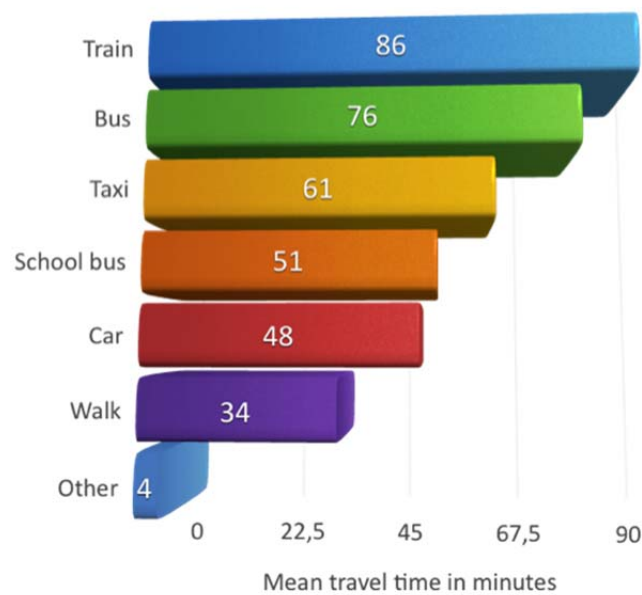
Travel on foot takes on average 34 minutes, which equates to roughly 2.5km (at the generally accepted walking speed of 1.2 metres per second) (Refer to Figure B-88 and Figure B-89).

Figure B-87: Work and education travel times by area



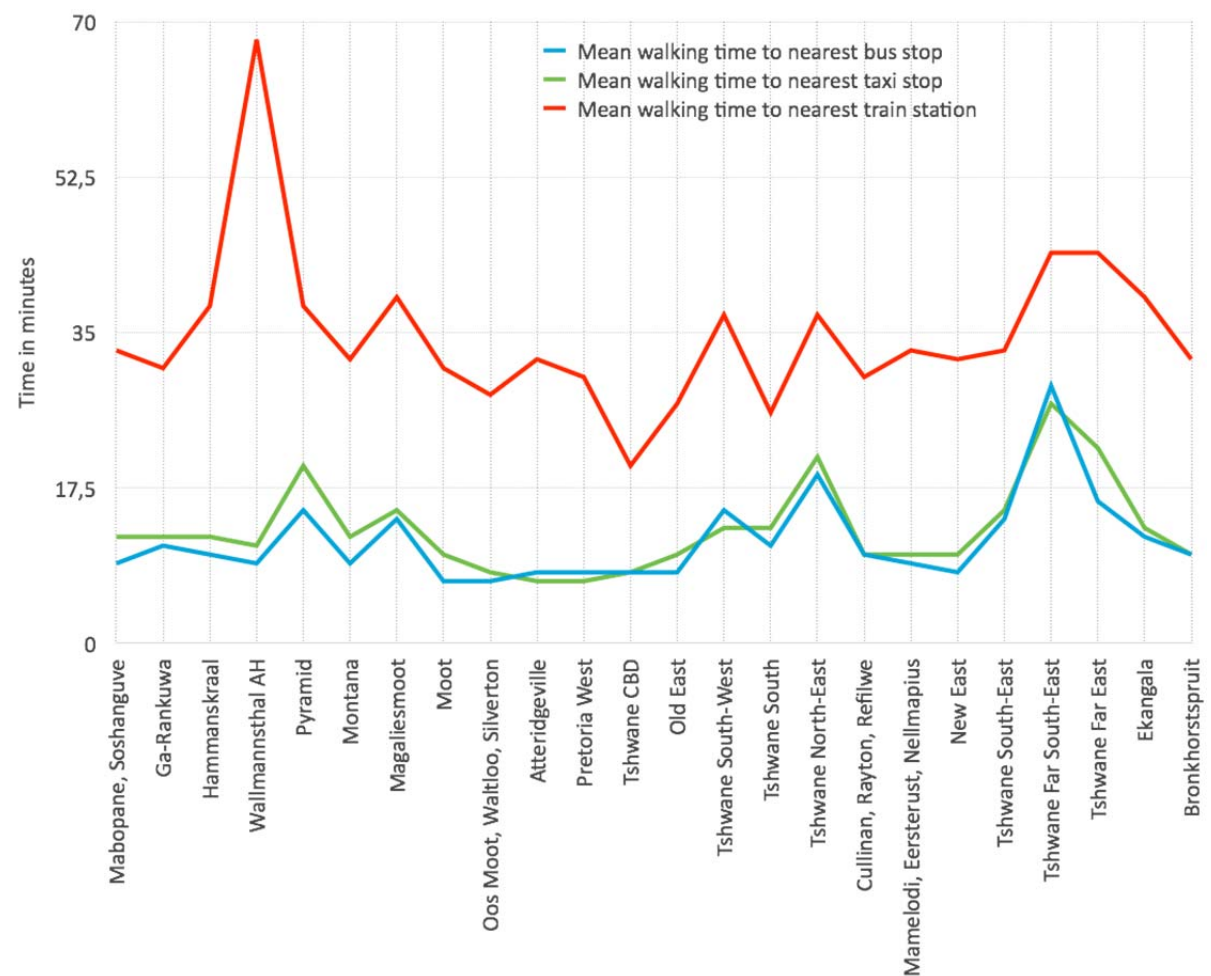
Source: Household Travel Survey Draft Technical Report, City of Tshwane (2013)

Figure B-88: Mean travel time by mode



Source: Household Travel Survey Draft Technical Report, City of Tshwane (2013)

Figure B-89: Mean walking time to nearest public transport stop



Source: Household Travel Survey Draft Technical Report, City of Tshwane (2013)

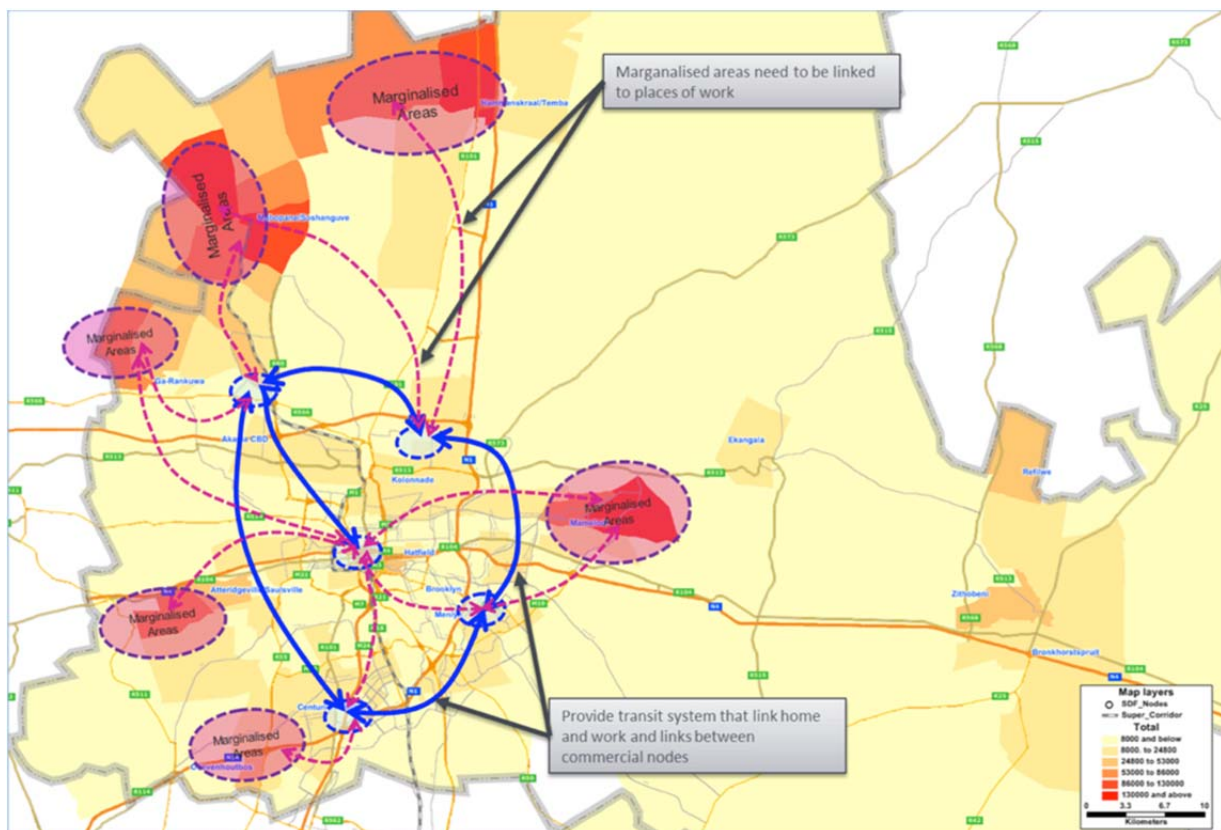
B.6.2 City Spatial Structure Implications on Transportation Demand

The city's transit system needs to provide linkages between main activity areas, such as areas of residence and places of work and education. Linking these areas and nodes will establish development corridors or integration zones.

Owing to the size and complex structure of urban and metropolitan nodes within the city, transit links need to be provided between the metropolitan and urban nodes.

These links will be both radial links that provide express services to the metropolitan nodes (Pretoria CBD, Menlyn and Centurion) and circular routes that provide direct connection between urban nodes (Hammanskraal to Mabopane, Monavoni to Centurion, Centurion to Mamelodi,). The marginalised areas and the strategic commercial nodes of the City of Tshwane that require transport service linkages as well as the main linkages between these areas are shown in Figure B-90.

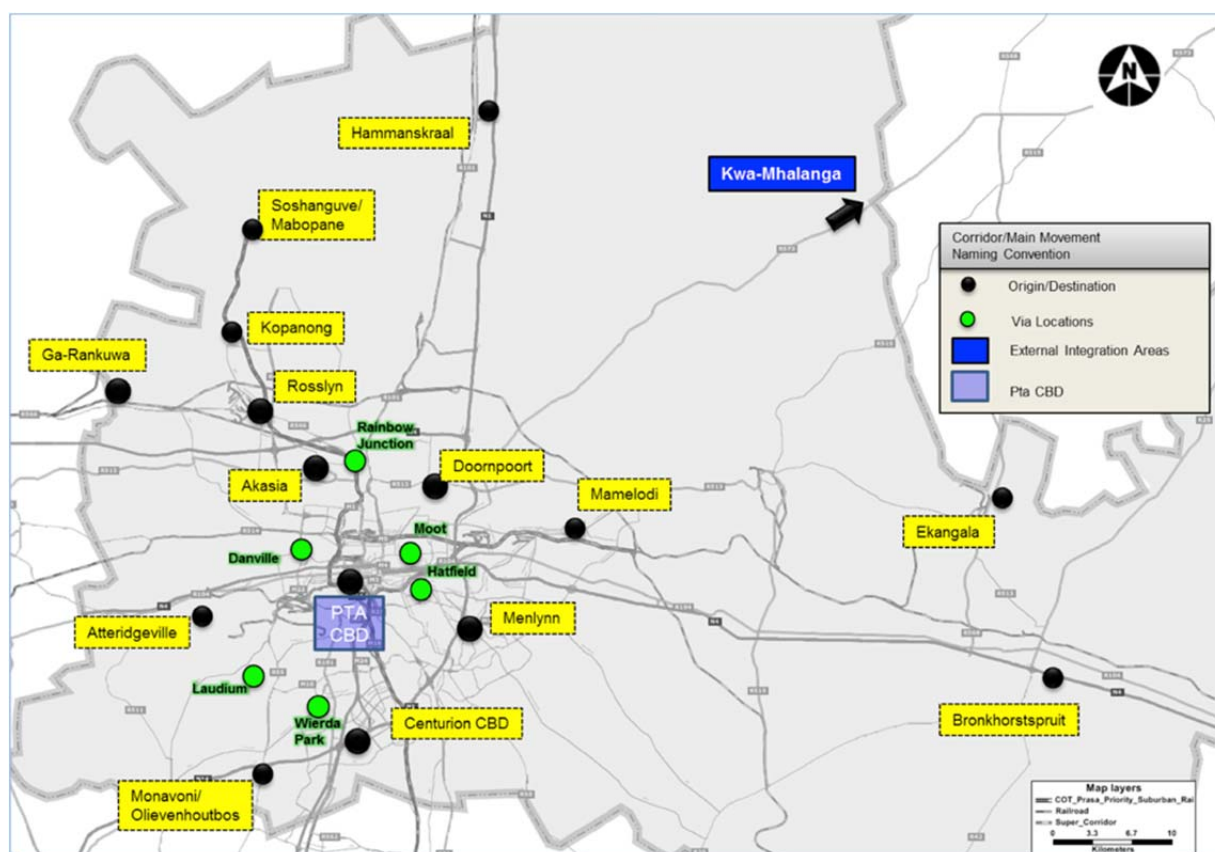
Figure B-90: Urban network system elements and resultant transport demand



Source: City of Tshwane Integrated Rapid Public Transport Network Operational Plan (February 2015)

The nodal hierarchy provided in the Spatial Development Framework of the city provides a good understanding of the primary transport origins and destinations of Tshwane. These origins and destinations are indicated in Figure B-91.

Figure B-91: Origins and Destinations for Primary Transport Demand Corridor Identification



The City of Tshwane demand model developed for the high level evaluation of the 2012 Integrated Rapid Public Transport Network (IRPTN) was applied to determine the primary demand corridors in the city. The 2013 model was updated to incorporate the latest demand estimations based on the Gauteng Integrated Transport Master Plan's (GITMP) land use and growth strategies. Three land use scenarios were developed for the GITMP model for the base year 2010, 2025 and 2037. These scenarios will be used to determine the primary demand corridors in the city that need to be serviced by the rapid transit network.

The total trips that originate from each transport-planning zone during the morning peak hour for the 2010 and 2037 modelling scenarios are shown in Table B.6.2-1 and Figure B-92. The percentage public transport users (all modes) is also indicated in the table, and based on these numbers the zones that generate the highest number of public transport users are Soshanguve North, Mamelodi, and Centurion.

Table B.6.2-1: Peak Hour Passenger Trips per Demand Corridor Analysis Zones

Area	Distance to CBD	Public Transport Percentage	Peak hour passenger trip 2037	Peak hour passenger trip 2025	Peak hour passenger trip 2010
Soshanguve North	35 km	90%	121 500	68 000	33 000

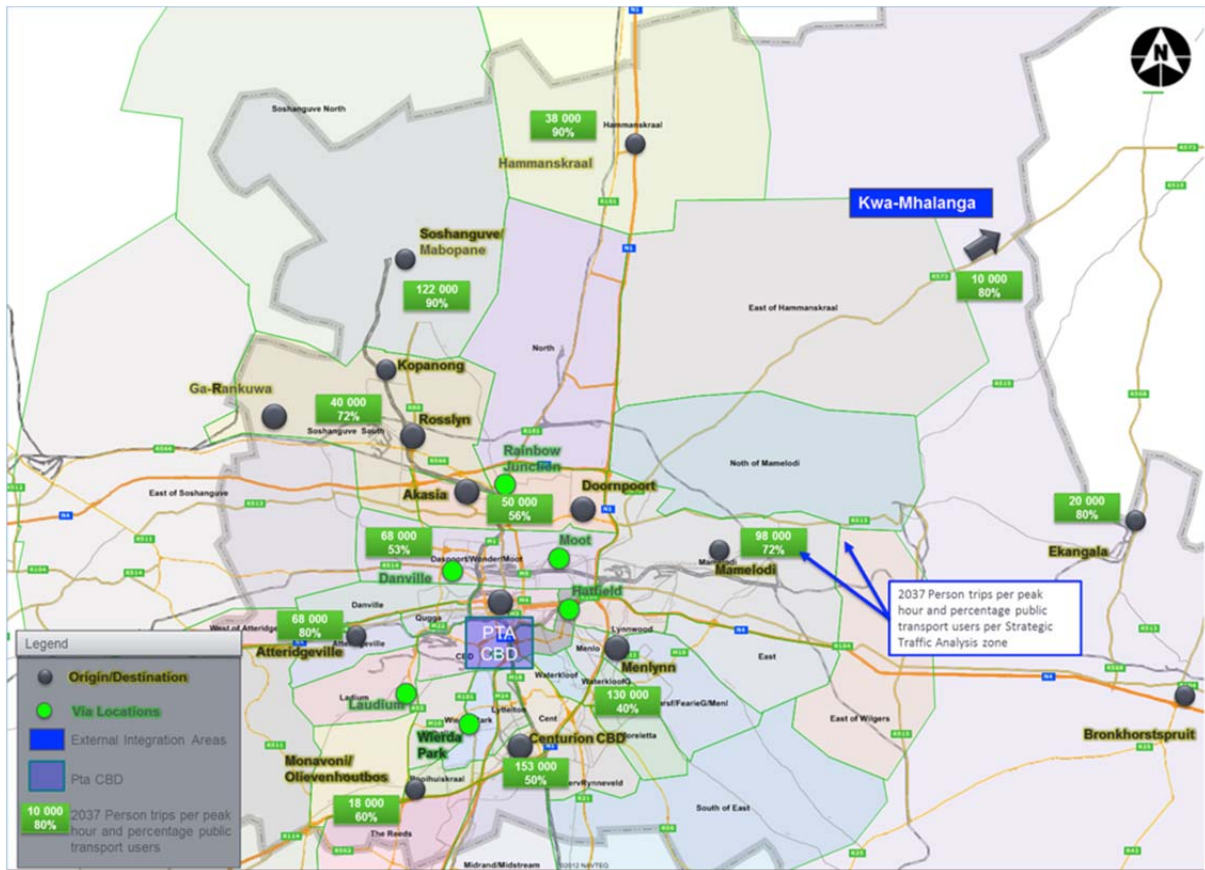
Area	Distance to CBD	Public Transport Percentage	Peak hour passenger trip 2037	Peak hour passenger trip 2025	Peak hour passenger trip 2010
Soshanguve South	24 km	72%	40 050	23 000	11 000
Hammanskraal	50 km	90%	38 250	22 000	11 000
Daspoort	10 km	53%	68 400	39 000	19 000
Atteridgeville	15 km	80% (Taxi 42%)	68 400	39 000	19 000
Mamelodi	26 km	72%	98 100	55 000	27 000
Monavoni/The Reeds	22 km	60%	18 000	11 000	5 000
The East	15 km	40%	130 500	73 000	35 000
Centurion	22 km	50%	153 000	86 000	41 000
Pretoria North	12 km	56%	50 400	29 000	00

Source: City of Tshwane Integrated Rapid Public Transport Network Operational Plan (February 2015)

Each of the transport-planning zones listed above was analysed in detail to determine the destinations where commuters travel to during the morning peak hour and the total demand to each of these destinations. These origin destination pairs, and the corresponding demand, was categorised to determine primary, secondary and minor demand movements so as to define the primary and secondary corridors for the purpose of the rapid transit network. The criteria for the three demand corridor categories are:

- Primary movements: more than 6 000 passengers per peak hour per direction (ppphpd)
- Secondary movements: 1 001 – 6 000 ppphd
- Minor movements: less than a 1000 ppphd

Figure B-92: Total Number of Person Trips per STAZ (2037)



Source: City of Tshwane Integrated Rapid Public Transport Network Operational Plan (February 2015)

B.6.3 Primary Transport Corridor Demand Analysis

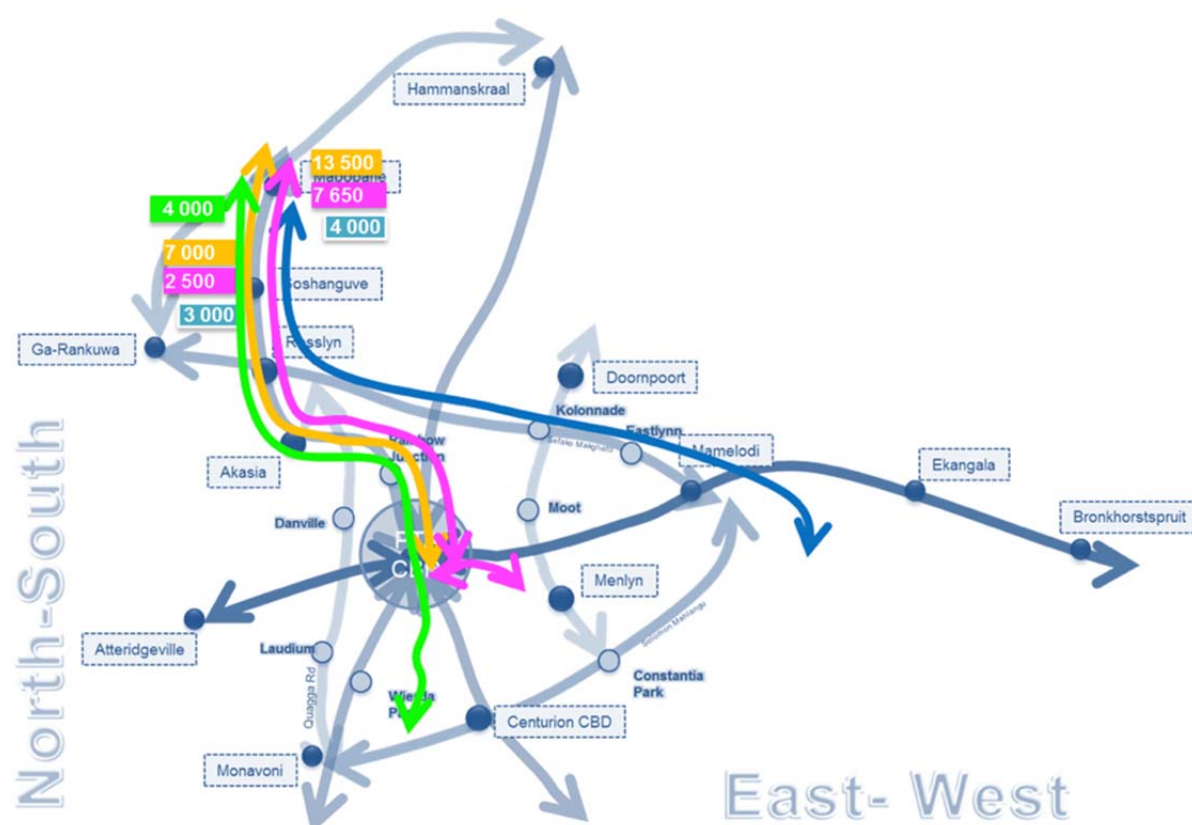
The origin-destination analysis in the previous chapter gave rise to the identification of primary, secondary and tertiary movement corridors within the City of Tshwane. This section serves to briefly unpack each of the primary demand corridors of the city in terms of origin-destinations served, first order corridor alignment and peak hour person trip demand.

B.6.3.1 Soshanguve North and South Demand Corridor

In Figure B-93 below the primary and secondary demand corridors from Soshanguve North and South are indicated based on trips originating from the STAZ zones. These are only a part of the total demand, lower order desire lines were excluded as they will be serviced through other services and not the rapid transit network.

- Primary destinations - Pretoria CBD, Hatfield,
- Secondary destinations – Mamelodi, The East, Moot, Centurion

Figure B-93: Soshanguve North and South Demand (2037)



Source: City of Tshwane Integrated Rapid Public Transport Network Operational Plan (February 2015)

The estimated demand in terms of passengers per peak hour per direction (ppphpd) from the areas to the primary and secondary destinations and the high-level mode selection is shown per scenario in Table B.6.3-1.

Table B.6.3-1: Soshanguve North and South 2010, 2025, 2037 Demand

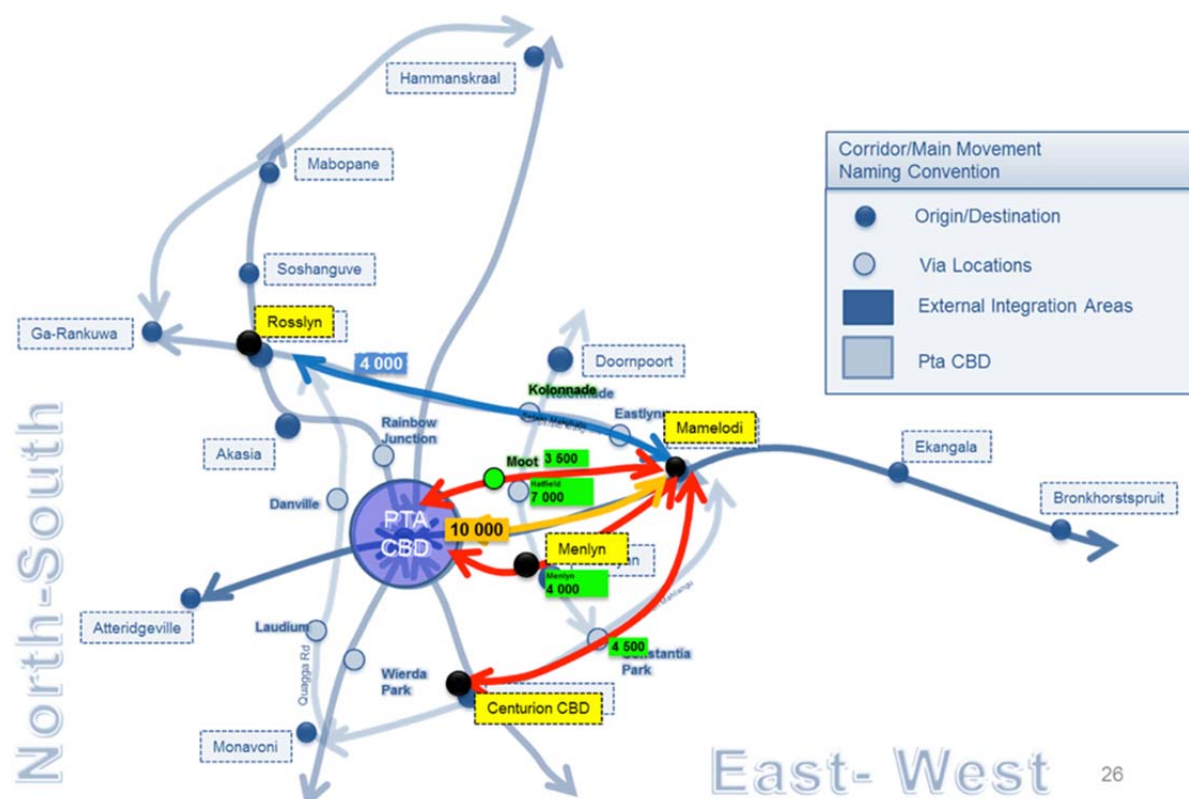
Destination	2010	2025	2037
CBD	8 000	15 000	20 500
Hatfield/Menlyn	3 000	6 000	10 350
Centurion	2 000	3 000	4 000
Mamelodi	2 000	4 000	7 000
Total Corridor Demand	15 000	28 000	41 000
Mode	BRT LRT	LRT Heavy Rail	Heavy Rail

Source: City of Tshwane Integrated Rapid Public Transport Network Operational Plan (February 2015)

B.6.3.2 Mamelodi Demand Corridor

In Figure B-94 below, the main demand corridors from Mamelodi are indicated. These are only a part of the total demand, lower order desire lines were excluded as they will be serviced through other services and not the rapid transit network. The main destinations from Mamelodi are the Pretoria CBD, Hatfield/Menlyn, Roslyn and Centurion.

Figure B-94: Mamelodi Demand (2037)



Source: City of Tshwane Integrated Rapid Public Transport Network Operational Plan (February 2015)

The estimated demand in terms of passengers per peak hour per direction (ppphpd) from the areas to the primary and secondary destinations and the high-level mode selection is shown per scenario in Table B.6.3-2.

Table B.6.3-2: Mamelodi Demand 2010, 2025, 2037

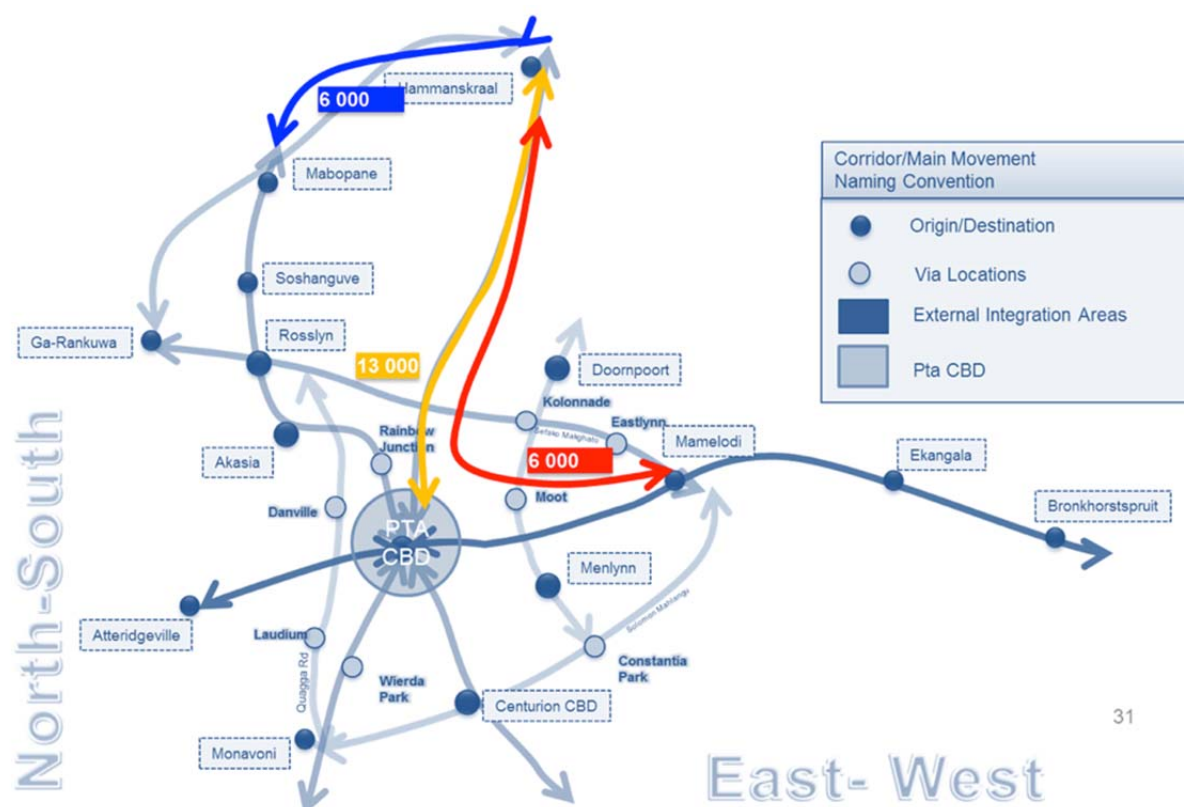
Destination	2010	2025	2037
CBD	4 000	8 000	13 000
Hatfield/Menlyn	4 000	7 000	11 000
Centurion	2 000	3 000	4 500
Roslyn	2 000	3 000	4 000
Corridor Total	12 000	22 000	33 000
Mode	BRT LRT	LRT Heavy Rail	Heavy Rail

Source: City of Tshwane Integrated Rapid Public Transport Network Operational Plan (February 2015)

B.6.3.3 Hammanskraal Demand Corridor

In Figure B-95 below the main demand corridors from Hammanskraal are indicated. These are only a part of the total demand, lower order desire lines were excluded as they will be serviced through other services and not the rapid transit network. The main destinations from Hammanskraal are the Pretoria CBD, Soshanguve North and Mamelodi.

Figure B-95: Hammanskraal Demand (2037)



Source: City of Tshwane Integrated Rapid Public Transport Network Operational Plan (February 2015)

The estimated demand in terms of passengers per peak hour per direction (ppphpd) from the areas to the primary and secondary destinations and the high-level mode selection is shown per scenario in Table B.6.3-3.

Table B.6.3-3: Hammanskraal Demand 2010, 2025, 2037

Destination	2010	2025	2037
CBD	4 000	8 000	13 000
Mamelodi	2 000	4 000	6 000
Soshanguve	2 000	4 000	6 000

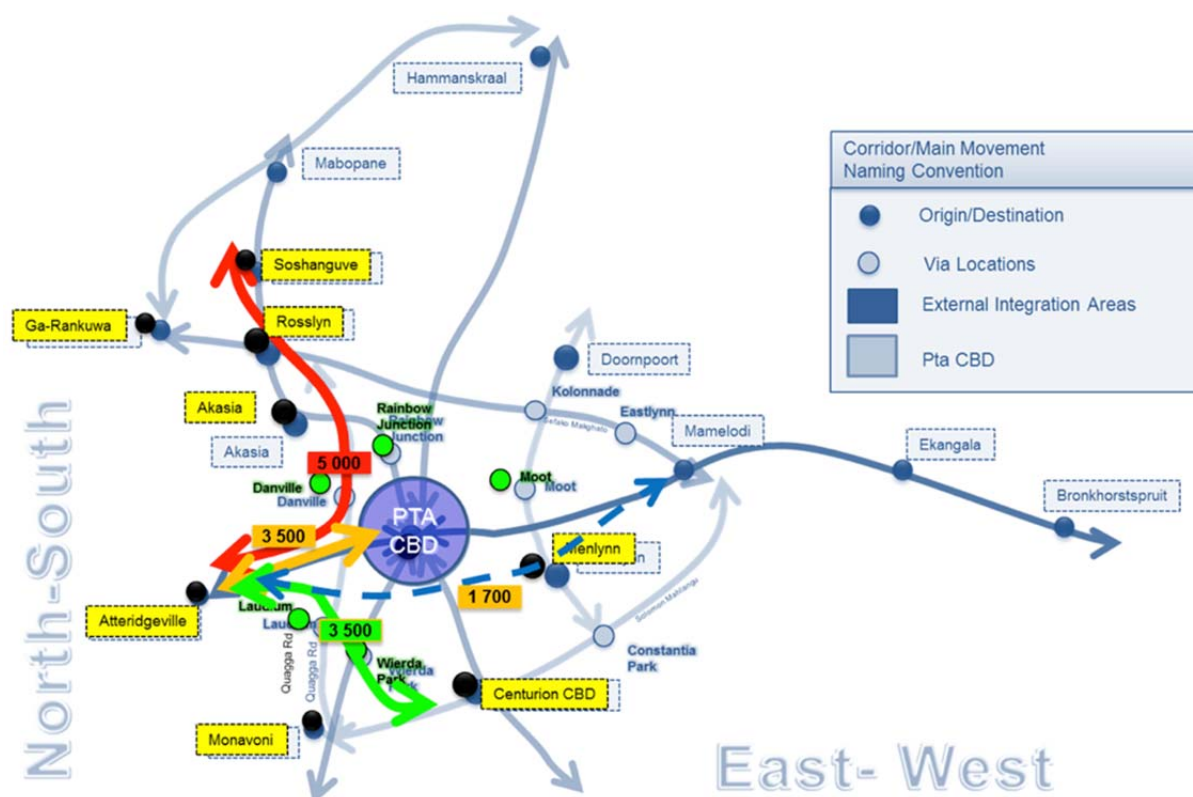
Corridor Total	8 000	16 000	25 000
Mode	BRT	BRT	Heavy Rail

Source: City of Tshwane Integrated Rapid Public Transport Network Operational Plan (February 2015)

B.6.3.4 Atteridgeville Demand Corridor

In Figure B-96 below the main demand corridors from Atteridgeville are indicated. These are only a part of the total demand, lower order desire lines were excluded as they will be serviced through other services and not the rapid transit network. The main destinations from Atteridgeville are the Pretoria CBD, Hatfield/Menlyn, Rosslyn and Centurion.

Figure B-96: Atteridgeville Demand (2037)



Source: City of Tshwane Integrated Rapid Public Transport Network Operational Plan (February 2015)

The estimated demand in terms of passengers per peak hour per direction (ppphpd) from the areas to the primary and secondary destinations and the high-level mode selection is shown per scenario in Table B.6.3-4.

Table B.6.3-4: Atteridgeville Demand 2010, 2025, 2037

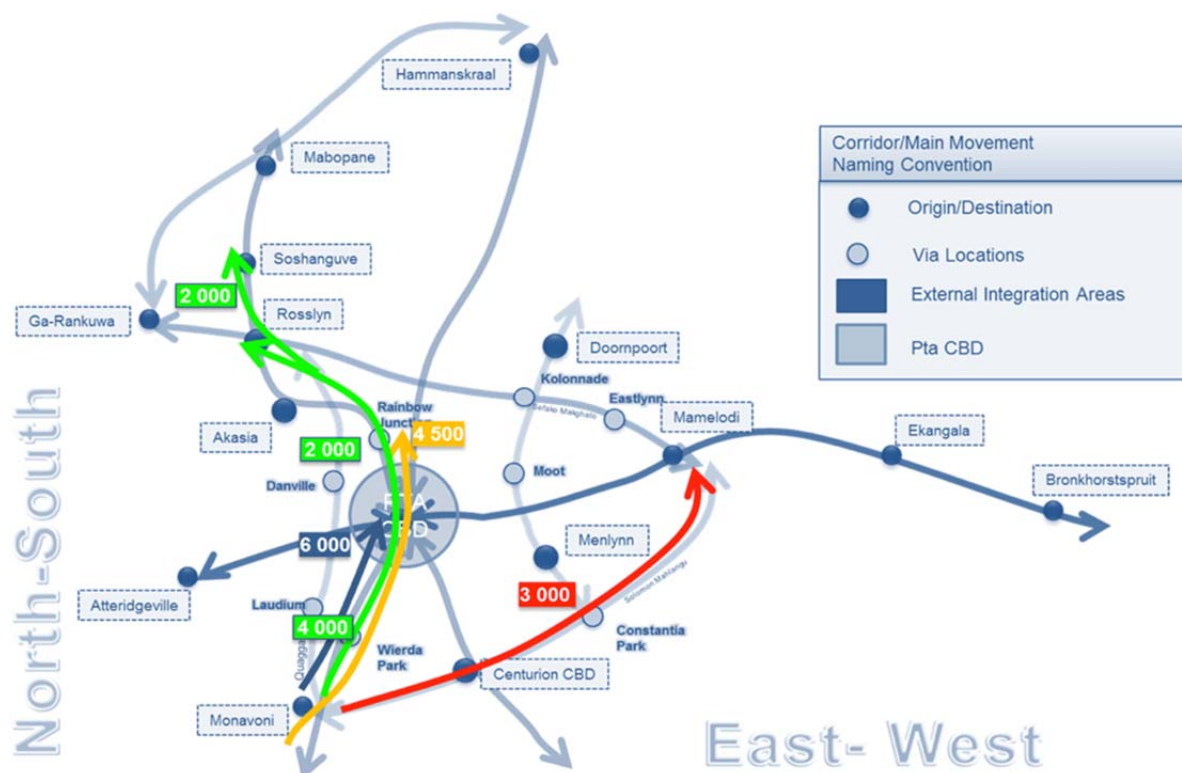
Destination	2010	2025	2037
CBD	1 000	2 000	3 000

Hatfield/Menlyn	1 000	1 000	1 700
Centurion	1 000	2 000	3 500
Rosslyn	2 000	3 000	5 000
Corridor Total	5 000	8 000	12 000
Mode	BRT	BRT/LRT	BRT

B.6.3.5 Monavoni Demand Corridor

In Figure B-97 below the main demand corridors from Monavoni are indicated. These are only a part of the total demand, lower order desire lines were excluded as they will be serviced through other services and not the rapid transit network. The main destinations from Mamelodi are Pretoria CBD, Rosslyn and Soshanguve North and South, Moot and Pretoria north and Centurion.

Figure B-97: Monavoni Demand (2037)



Source: City of Tshwane Integrated Rapid Public Transport Network Operational Plan (February 2015)

The estimated demand in terms of passengers per peak hour per direction (pphpd) from the areas to the primary and secondary destinations and the high-level mode selection is shown per scenario in Table B.6.3-5.

Table B.6.3-5: Monavoni Demand 2010, 2025, 2037

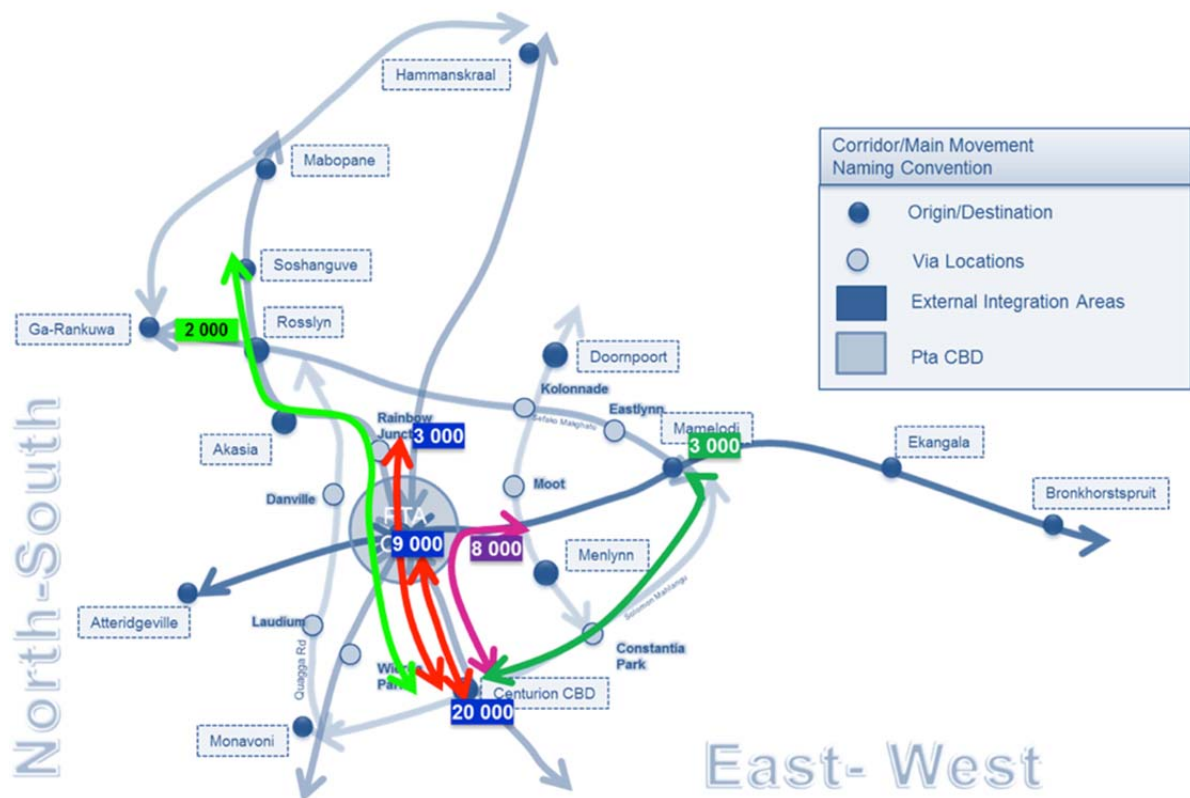
Destination	2010	2025	2037
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CBD	2 000	4 000	6 000
Mamelodi	1 000	2 000	3 000
Moot/Pta North	2 000	3 000	4 500
Rosslyn	2 000	3 000	4 000
Corridor Total	7 000	13 000	17 000
Mode	BRT	BRT/LRT	BRT/LRT

B.6.3.6 Centurion Demand Corridor

In Figure B-98 below the main demand corridors from Centurion are indicated. These are only a part of the total demand, lower order desire lines were excluded as it will be serviced through other services and not the rapid transit network. The main destinations from Centurion are the Pretoria CBD, Rosslyn and Soshanguve North and South, Moot and Pretoria north and Centurion.

Figure B-98: Centurion Demand (2037)



Source: City of Tshwane Integrated Rapid Public Transport Network Operational Plan (February 2015)

The estimated demand in terms of passengers per peak hour per direction (ppphpd) from the areas to the primary and secondary destinations and the high-level mode selection is shown per scenario in Table B.6.3-6.

Table B.6.3-6: Centurion Demand 2010, 2025, 2037

Destination	2010	2025	2037
CBD	3 000	6 000	9 000
Mamelodi	1 000	2 000	3 000
Moot/Pta North	1 000	2 000	3 000
Rosslyn	1 000	2 000	2 000
Hatfield/Menlyn	3 000	5 000	8 000
Corridor Total	9 000	17 000	25 000
Mode	BRT	BRT/LRT	LRT/Heavy Rail

B.6.3.7 Ga-Rankuwa Demand Corridor

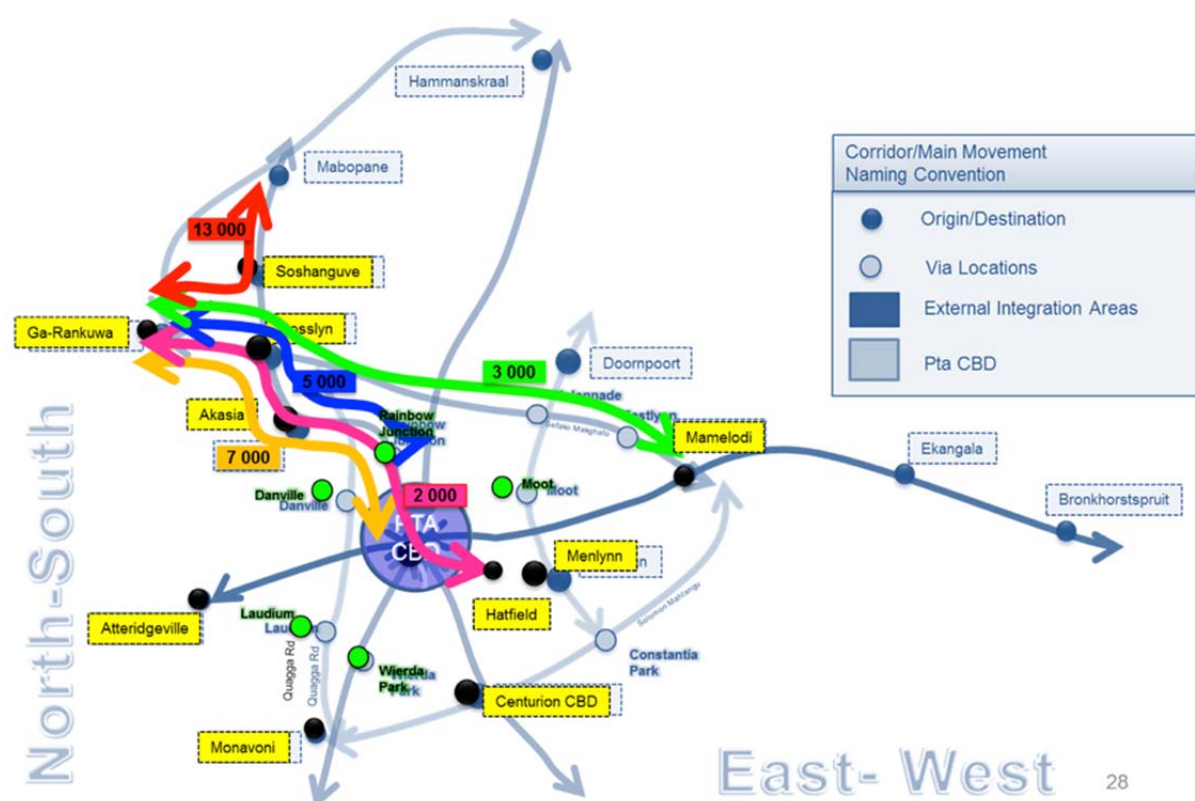
In Figure B-99 below the main demand corridors from Ga-Rankuwa are indicated. These are only a part of the total demand, lower order desire lines were excluded as they will be serviced through other services and not the rapid transit network. The main destinations from Ga-Rankuwa are the Pretoria CBD, Rosslyn and Soshanguve North and South, Moot and Pretoria north and Centurion.

The estimated demand in terms of passengers per peak hour per direction (ppphpd) from the areas to the primary and secondary destinations and the high-level mode selection is shown per scenario in Table B.6.3-7.

Table B.6.3-7: Ga-Rankuwa Demand 2010, 2025, 2037

Destination	2010	2025	2037
Soshanguve North	4 000	8 000	13 000
CBD	2 000	4 000	7 000
Mamelodi	1 000	2 000	3 000
Moot/Pta North	2 000	3 000	5 000
Hatfield/Menlyn	1 000	2 000	2 000
Corridor Total	6 000	11 000	17 000
Mode	BRT	BRT	LRT

Figure B-99: Ga-Rankuwa Demand (2037)



Source: City of Tshwane Integrated Rapid Public Transport Network Operational Plan (February 2015)

B.6.3.8 Pretoria East Demand Corridors

In Figure B-100 below the main demand corridors and peak hour passenger demand from Pretoria East, Ekangala and Kwa-Mhlanga are indicated. These corridors present the primary movements from the areas. Lower demand desire lines were excluded, as they will be serviced through other services and not the rapid transit network. The main destinations from these areas are:

- Pretoria East to Pretoria CBD, Hatfield and Mamelodi.
- Kwa-Mhlanga to Centurion/Midrand, The Reeds and Pretoria CBD,
- Ekangala to Pretoria CBD, Menlyn and Moot/Daspoort.

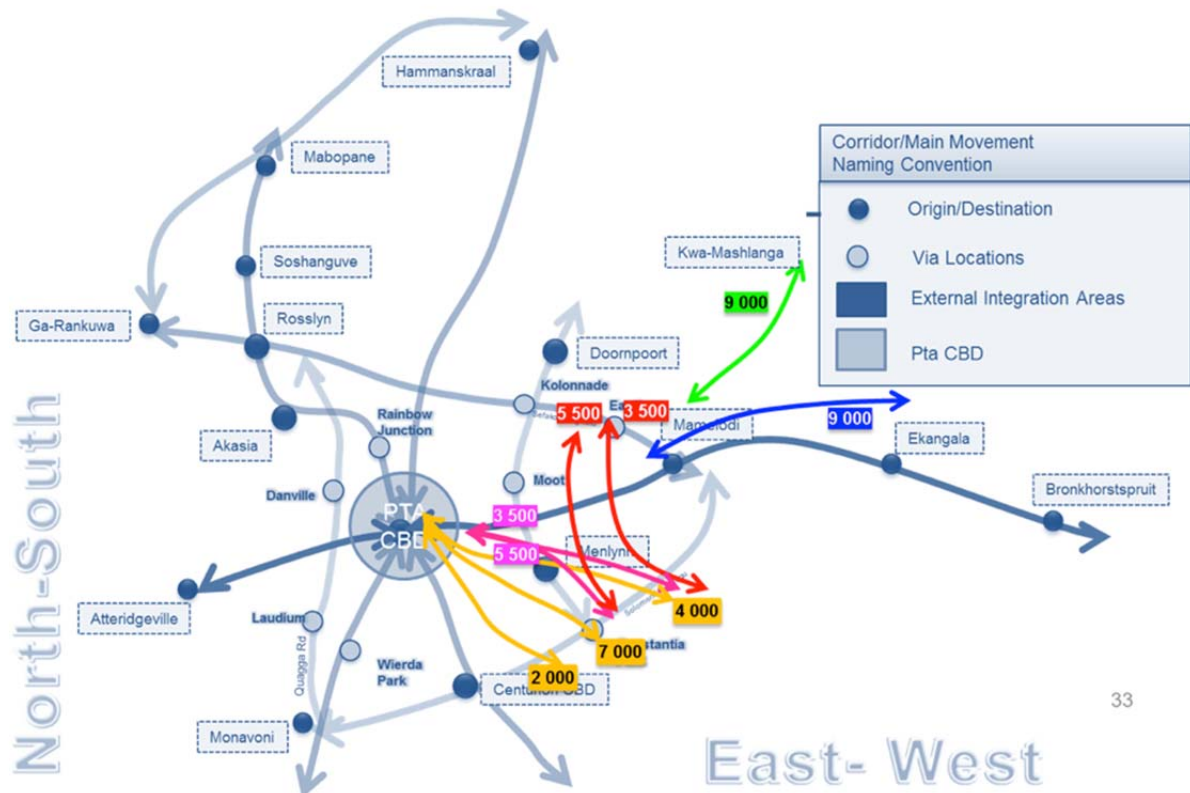
The estimated demand in terms of passengers per peak hour per direction (ppphpd) from the areas to the primary and secondary destinations and the high-level mode selection is shown per scenario in Table B.6.3-8.

Table B.6.3-8: Pretoria East, Kwa-Mhlanga and Ekangala 2010, 2025, 2037

From	Destination	2010	2025	2037
Ekangala	Centurion / Midrand	1500	2500	4000

Ekangala	The Reeds	500	1000	1000
Ekangala	CBD	1000	1500	2000
Ekangala	Moot / Daspoort / Rosslyn	1000	1500	2000
Ekangala	Menlyn	500	1000	1000
Kwa-Mhlanga	Centurion / Midrand	1500	2500	4000
Kwa-Mhlanga	The Reeds	500	1000	1200
Kwa-Mhlanga	CBD / Hatfield / Moot	1000	1500	2000
Kwa-Mhlanga	Moot / Daspoort / Rosslyn	1000	2000	3000
Pretoria East	CBD	3500	6500	11000
Pretoria East	Hatfield / Menlyn	2000	4000	7000
Pretoria East	Mamelodi	3000	5500	9000

Figure B-100: Pretoria East, Kwa-Mhlanga and Ekangala Demand (2037)



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Source: City of Tshwane Integrated Rapid Public Transport Network Operational Plan (February 2015)

C Strategies and Programmes

C.1 Long Term Vision



BEPP Content Guidelines – as per BEPP Guidance Note 2015/16-2017/18

This section of the BEPP should seek to:

- A description of the long-term vision of the metro in relation to the newly developed Built Environment Indicators at the city-wide level.

C.1.1 Tshwane Vision 2055

Following from the City Development Strategy of 2004 and informed by the spatial transformation principles of the National Development Plan 2030 (spatial justice, spatial sustainability, spatial resilience, spatial quality, spatial efficiency) and the objectives of Gauteng Vision 2055 (equitable growth, social inclusivity and cohesion, sustainable development and infrastructure, good governance), Tshwane Vision 2055 provides an overarching strategic vision for the City of Tshwane that is to guide growth and development within the City and serve as a point of reference for future intervention, priorities and strategies.

“In 2055, the City of Tshwane is liveable, resilient and inclusive whose citizens enjoy a high quality of life, have access to social, economic and enhanced political freedoms and where citizens are partners in the development of the African Capital of Excellence”

- Tshwane, My City, Our Capital -

In so doing, the vision is based on six (6) outcomes:

- Outcome 1: A resilient and resource efficient City.
- Outcome 2: A growing economy that is inclusive, diversified and competitive.
- Outcome 3: Quality infrastructure development that supports liveable communities.
- Outcome 4: An equitable City that supports happiness, social cohesion, safety and healthy citizens.
- Outcome 5: An African capital city that promotes excellence and innovative governance solutions.
- Outcome 6: South Africa’s capital with activist citizenry that is engaging, aware of their rights and presents themselves as partners in tackling societal challenges.

In alignment with these outcomes, Tshwane Vision 2055 outlines a Spatial Reform Agenda that seeks to:

- Drive spatial transformation through densification and compact development;
- Address many of the ills currently caused by urban sprawl;
- Achieve a balanced sustainable growth to optimise the potential and infrastructure capacity;
- Revitalise and develop new economic nodes that support transit-oriented development and public transport systems. In line with this future development is to be based within strategic catchment areas located along major public transport routes;
- Strategically invest in infrastructure targeting various nodes, corridors, activity spines, and strategic land parcels that support higher intensity mixed use development;
- Achieve a balanced sustainable urban growth by implementing a certain density typology based on the characteristics of the locality, in line with the principles of new urbanism;
- Conserve and protect natural resources through the intentional ordering of urban development within the boundaries of specific delineations; and
- Give equal access to the City's social and economic infrastructure. No person should have to walk more than 800m within a node to find a form of quality public transport.

C.2 The Spatial Development Strategy of the Municipality

BEPP Content Guidelines – as per BEPP Guidance Note 2015/16-2017/18

This section of the BEPP should seek to:

- The Metro Spatial Development Strategy in relation to the envisioned performance of the built environment (informed by the newly developed Built Environment Indicators) at the city-wide level; as well as the expected impact of catalytic urban development projects. That is the strategy for the functional integration of economic and social infrastructure supported by transport, housing, related community infrastructure and ecological infrastructure.
- An overview of area-based management initiatives including strategic projects of the municipality (city-wide or that which falls outside of Integration Zones). Provide a specific focus on informal settlements and other marginalised areas.
- Co-ordination and alignment with SIPs where relevant at the city-wide level.
- Land release and development strategy at the city-wide level.

Input Data:

- Input required from MSP - SDF submission from Namagaya

C.2.1 Identification of Urban Network, Integration Zones and Hubs / Nodes

BEPP Content Guidelines – as per BEPP Guidance Note 2015/16-2017/18

This section of the BEPP should seek to:



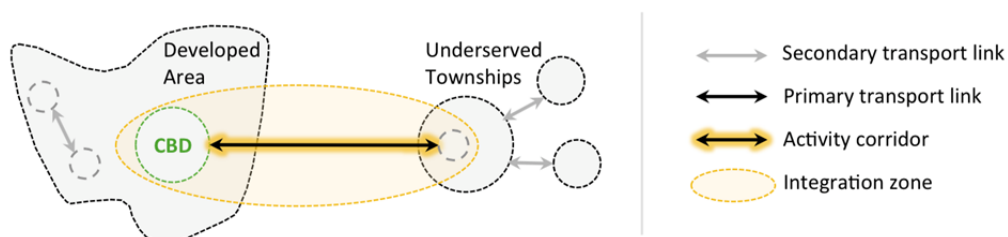
- Unpack any refinement, enhancement and consolidation of the identification, description, prioritisation and phasing of the integration zone(s) in the municipality, including their geographical boundaries, taking the rationale for their identification and prioritisation from the metros Urban Network element identification process and the Urban Networks Strategy (with its associated spatial, economic and developmental objectives).

C.2.1.1 The City of Tshwane Urban Network Strategy

The Urban Network Strategy is a national policy directive that informs spatial planning at both a provincial and regional scale and forms the basis of the Built Environment Performance Plan by providing a spatial approach by which to target investment. The Urban Network Typology comprises:

- The Central Business District, an area for focused regeneration and management,
- Urban hubs, including both traditional and emerging centres of economic activity, within which mixed used development is to be encouraged and managed;
- Activity corridors, which connect the urban hubs and the CBD, along which rapid public transport and integrated high-density land development is to be promoted;
- Smaller nodes, within which mixed-use development is similarly to be promoted;
- Secondary transport linkages that are to ensure the spatial integration of smaller nodes by connecting them to urban hubs; and
- Integration zones, which represent a collective of these typologies and form the prioritised spatial focus areas for coordinated public intervention.

Figure C-1: The Urban Network Typology (National Treasury)



In line with the Gauteng Spatial Development Framework and the Urban Network Strategy, the MSDF identifies specific structuring elements to guide development within the Region. This includes (refer to Table C.2.1-1 and Figure C-2):

- Urban mixed-use activity nodes, which have been classified hierarchically as follows:
 - The Capital Core i.e. the Tshwane inner city – an area for focused regeneration and management;
 - Metropolitan Nodes i.e. primary nodes of regional and provincial relevance which function as economic hubs and focal points for employment opportunities;
 - Urban Cores which represent the former township areas that developed as a result of forced relocation programmes; and
 - Emerging Nodes i.e. areas with future possible potential for development.
- Open space and green systems;
- Public transport and movement routes to promote connectivity within and between the nodes;
- Urban corridors and activity spines along which mixed-use densification is to be promoted; and
- Specialised activity areas characterised largely by mono-functional land uses of metropolitan significance, including: industrial estates; research, innovation, education and technology institutes; airports etc.

Table C.2.1-1: Nodes within the City of Tshwane Urban Network Structure

Node	Areas within Node	
The Capital Core	CBD	
Metropolitan Nodes	Akasia; Kolonnade; Brooklyn; Hatfield; Menlyn; Centurion; Bronkhorstspuit	
Urban Cores	Hammanskraal/Temba; Mabopane/Soshanguve; Ga-Rankuwa; Atteridgeville/Saulsville; Mamelodi; Ekangala; Refilwe Zithobeni; Olievenhoutbosch	
Emerging Nodes	Soshanguve/Kopanong; Pretoria North/Rainbow Junction; Hazeldean; Woodlands; Wingate Park; Irene; Monovani;	
Specialised Activity Areas	Industrial Estates	Babelegi; Ga-Rankuwa; Rosslyn; Kelrksoord; Kirkney; Hermanstad; Pretoria Industrial; Sunderland Ridge; Rooihuiskraal; Irene; Hennospark; Samcor Park; Waltloo; Silvertondale; Koedoespoort; Silverton; Ekandustria.
	Research, Innovation, Education and Technology Institutes	Council for Scientific and Industrial Research (CSIR) and Innovation Hub (Blue IQ); Highveld Technopark; Human Science Research Council (HSRC); George Mukhari Academic Hospital; Onderstepoort Research Laboratory/Vetinary Institute; Steve Biko Academic Hospital; Tshwane University of Technology; University of Pretoria; Thaba Tshwane
	Airports	Waterkloof Air Force Base; Zwartkop Air Force Base
	Tourism Nodes	Dinokeng Nature Reserve; Cullinan

Within this context, nodes represent areas for focused infrastructure investment to support and facilitate economic development and growth. Metropolitan nodes within the City of Tshwane are largely already spatially integrated with a number of economic investment centres on a strategic scale and have benefited significantly from private sector investment. Urban Cores, however, represent areas of significant need both from a social upliftment and spatial integration perspective.

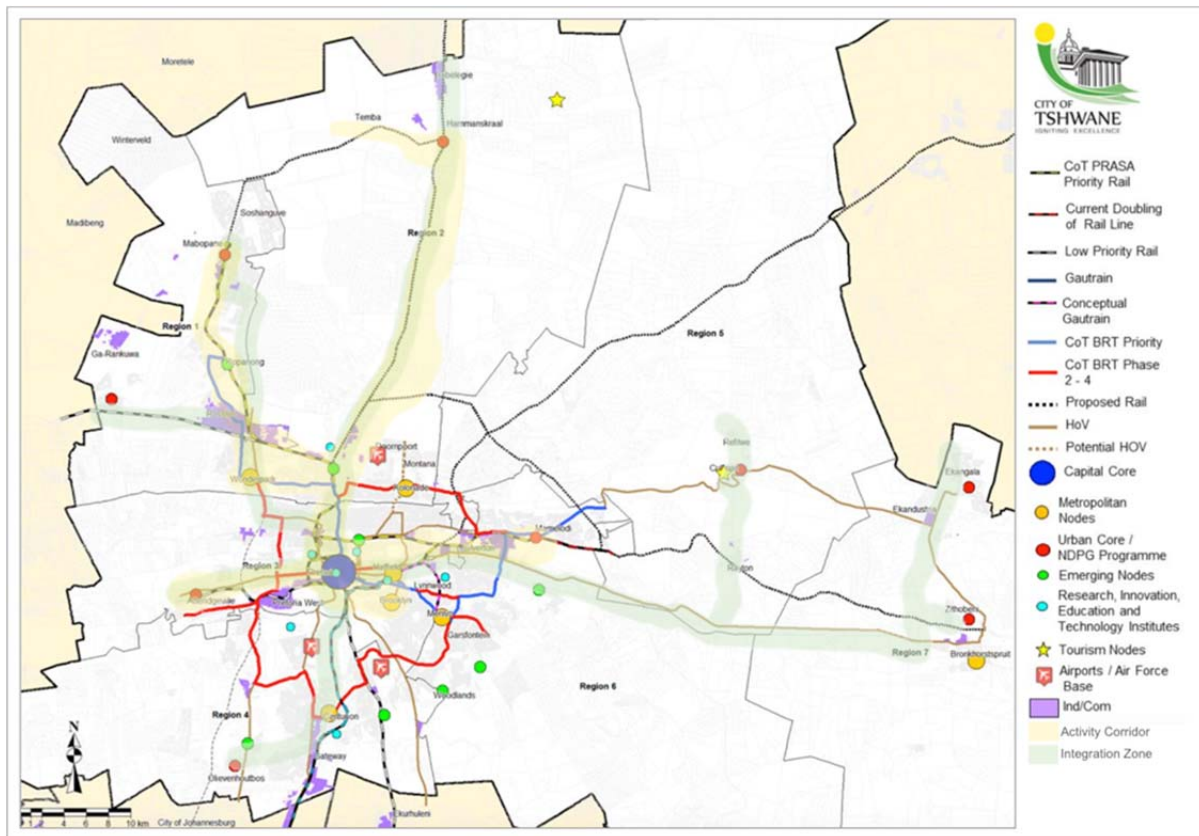
The sustainability of the nodal concept is dependent on connectivity and ease of access from one node to the other. Connectivity via the movement system effectively strings the city together, making it 'smaller' and providing equal access for all residents to all nodes, integrating labour markets, and providing flexibility around options for residential location versus one's place of work.

The IRPT network seeks to optimally integrate road, rail and air transport within the CoT. The intention therefore is that the IRPTN will allow equal access for all residents to all nodes in the City, and in so doing, ensure the spatial integration of the City's labour markets.

Also embedded in the MSDF is the principle that the catchment area of each node in the City of Tshwane should be fully covered in terms of feeder route systems that support the main transportation routes, and that no person should have to walk more than 800m within a node to find a form of public transport. It is therefore equally important that the routes to the public transport mode or facility are fully pedestrianized and appropriately accommodate people with special needs.

Integration zones represent the combination of nodes and connectivity corridors, which form the prioritised spatial focus areas for coordinated public intervention.

Figure C-2: City of Tshwane Urban Network Strategy



C.2.1.2 Coordination and Alignment with Strategic Infrastructure Projects (SIPs)

The nationally prepared strategic infrastructure projects (SIPs) cover social and economic infrastructure and include catalytic projects that can fast-track development and growth. Two strategic infrastructure projects are to be implemented in the City of Tshwane, namely:

- SIP 2: Durban-Free State-Gauteng logistics and industrial corridor

The aim of projects that form part of SIP2 is to strengthen the logistics and transport corridor between South Africa's main industrial hubs. Freight in the City of Tshwane has been discussed under Sub-Section B.2.2.2 above.

- SIP 7: Integrated urban space and public transport programme

This project aims to coordinate planning and implementation of public transport, human settlement, economic- and social infrastructure and location decisions into sustainable urban settlements connected by densified transport corridors.

Allocations are made for the implementation of the Tshwane Rapid Transit (TRT) route in the City of Tshwane 2015/2016 Capital Budget to the value of R745 609 000. This is a continuation from the previous financial year's work on the TRT project.

Densification with the correct yields and housing typologies around the TRT route must be spatially ensured. This is an immediate short-term objective. TRT Trunk Routes will have stops at Soshanguve, Rosslyn, Akasia, Rainbow Junction, CBD, Hatfield, Menlyn and Mamelodi.

C.2.1.3 Guiding Principles for the Development of Nodes within the City of Tshwane

In line with the spatial policies of the City of Tshwane, the following principles underpin the development of sustainable urban nodes:

- Compact Cities;
- Transit Orientated Development (TOD); and
- New Urbanism.

These principles are both complimentary and overlapping. The distinctions and implications of these principles, in practical terms, are briefly outlined in the subsections to follow.



C.2.1.3.1 Compact Cities

The Compact City concept is one that promotes high-density residential developments and mixed land-use in an intense urban form. It emphasises the close proximity of urban activities to promote easy access to these activities via public transport, walking, and cycling, as well as allowing for efficient provision of utilities and infrastructure (Burgess & Jenks, 2000).

Also known as a city of short distances, a compact city encourages walking and cycling as opposed to travelling in private cars, which in turn reduces energy consumption and pollution. The purpose of the compact city is to reduce the need for resources and land whilst enhancing the quality of life. Planning of a compact city needs to take into account the guiding principles of mixing of land uses, developing small walkable blocks, mingling of building ages and types and ensuring a dense concentration of people.

For Tshwane to be transformed into a compact city the following will need to be achieved:

- More residents will choose to walk or cycle to work/ school/ services. In order for this to successfully happen, users of the existing vehicle, pedestrian and cycle facilities will need to be educated so that pedestrians and cyclists have priority over motor vehicles, are safe and are respected by motorists. Residents will feel safe to walk or cycle to destinations at all times of day or night.
- Travel times, distances and costs will be reduced to be around 10% of the users income.

- Public transport will be diverse, reliable, safe, regular and affordable.
- Dwelling unit densities of 40 units per ha or more will be achieved.
- Residents will have access to diverse local services and jobs. Fewer residents will need to leave a specific node for work but instead will have local work and business opportunities within that node.
- Annual household income will increase but car ownership will not.
- A mix of office, business, retail, residential, service and education land uses will be found in the same area. Residents can live, work and play in the same area. This means that someone living within a specific node can also shop there, work there, go to the doctor there and study there.
- Less parking will be provided.
- There will be an increase in multi-story buildings, be they for residential use or other uses.
- A range of dwelling types will be available in the same area; single-story and multiple-story, bachelor units and family houses.
- Existing brownfield sites will be redeveloped.
- Existing buildings will be retrofitted to create buildings that contribute towards the compact city trend.
- There will be more sharing of open spaces with fewer private gardens. Open spaces will be safe and maintained.
- More resources will be dedicated to non-motorised and public transport and less to private transport. This includes space, initial investment and maintenance.

C.2.1.3.2 Transit Orientated Development

A Transit Orientated Development (TOD) node is an area of mixed uses, for example residential buildings combined with commercial buildings, built around a transit point or transport corridor, such as a train station, a multi-modal public transport facility or a bus rapid transit line. The area will be made up of high-density development such a multi-story residential units or offices, within a radius of preferably 400m, but no more than 800m. The significance of the radius is related to acceptable walking distances; it is preferred that a commuter exiting the transit point should not have to walk further than 800m (or 10 minutes) to his final destination, although the shorter 400m (or 5 minute) is a preferred target albeit not always obtainable. This provides a solution to the “last mile” problem i.e. getting a commuter from the transport system to their final destination.

The guiding principles for developing a TOD are complementary and similar to those of a compact city:

- The development should be built around transit point or transport corridor, to a maximum of 800m from said point/ corridor.
- The development should be made up of high-density, mixed land uses.
- The development should be structured around small, walk-able blocks.

It is the intention that stations along the IRPTN corridors, particularly along activity corridors be developed in line with the principles of TOD. In so doing, the following would need to be achieved:

- The area within an 800m radius of the transit point or transport corridor would be developed, or retrofitted, to consist of high-density residential and commercial buildings.
- The existing blocks within the 800m radius would be retrofitted to include wide walkways, pedestrian alleys, pedestrian crossings and other infrastructure conducive to a high-volume pedestrian area.

C.2.1.3.3 New Urbanism

New Urbanism is an urban design movement that encourages the development of mixed-use, mixed-income, walkable, high-density areas which are combined in a manner that creates a vibrant and liveable environment. This is a definite move away from the typical suburban developments that have occurred over the last half-century i.e. low-density, car-dependant, residential areas located some distance away from the city centre or retail and commercial areas of a town.

The guiding principles of new urbanism, similar and complementary to those of compact cities and TOD's, are:

- Mixed land use i.e. residential, commercial, educational, retail and recreational activities within the same area.
- Mixed-income i.e. simpler, bachelor units in the same area as exclusive penthouses and family homes.
- High-density i.e. multi-story buildings located closer together

A neighbourhood developed in line with the New Urbanism concept would have the following:

- A mix of varying types of multi-story residential dwelling units located next to office developments with retail component surrounding a town square or other attraction.
- Schools within an easy walking distance of the residential developments.

- Safe and attractive walkable streets that are focussed on the pedestrian rather than the vehicle.

C.2.1.4 Prioritisation of the Urban Cores

C.2.1.4.1 Background

Within the City of Tshwane's Urban Network Strategy, Urban Cores represent areas of significant need both from a social upliftment and spatial integration perspective. In line with this mandate, the City of Tshwane is in the process of developing medium to long term development plans and implementation strategies, referred to as Development Intervention Portfolios (DIPs), for these key nodal areas, with the intention to pro-actively structure and optimize development in order to create a city that is not only spatially efficient, but that also provides for improved quality of life. To guide the sequencing of the Development Intervention Portfolios and capital investment within the Urban Cores, a first order prioritization of these nodes was undertaken.

Multi-Criteria Analysis (MCA) is an established technique for the appraisal of multiple alternatives and was since utilized for the purposes of facilitating an objective and quantifiable prioritization process. In so doing, the following methodology was applied:

- An explicit set of principles was defined to inform and guide the prioritization framework;
- In line with these principles, a set of criteria was defined by which to characterize each of the Urban Cores, to which a relative weighting was assigned;
- A rating scale was determined to quantitatively rank the Urban Cores i.e. a numerical score on a strength of preference scale, where the more preferable the option, the higher the score.
- The framework was populated and the rating scale applied to score and rank each Urban Core.

C.2.1.4.2 Principles to Guide the Prioritisation Framework

In line with the City of Tshwane's Metropolitan Spatial Development Framework, and the guiding principles as outlined in Section C.2.1.2, the prioritization of the Urban Cores is based on the following principles:

- The development of a compact city: Compaction and densification are core principles of the MSDF. In line with this, the theory of the compact city underpins the prioritization framework. Compact cities are characterized by densified development patterns, public transport connectivity, and accessibility to local services and employment opportunities. For the purposes of the prioritization framework, a compact city buffer has been defined i.e. a 25km radius from the Capital Core. This radius is typically defined to ensure that public transit commute times to places of employment are limited to 20 minutes or less.

- The development of Transit Orientated precincts: In line with the principles of compaction and densification, the spatial policy outlined within the City of Tshwane's MSDF calls for Transit Orientated Development i.e. as a mechanism to develop a more compact city and as a means to optimize the potential and infrastructure capacity of nodes. The identification of potential TOD precincts has thus been identified as a critical component of the prioritization framework.
- Social upliftment: As former under serviced township areas, the Urban Cores represent areas of significant need particularly as regards the provision of, and access to, basic services and social infrastructure, a strategic objective of the City of Tshwane and an enabling component of the Development Intervention Portfolios. An understanding of current service provision within the Urban Cores is therefore central to identifying areas with the greatest need for investment.
- Capitalizing on existing spatial opportunities: In addition to identifying areas of greatest social need, the identification of areas with the greatest immediate opportunities is also considered a significant aspect of the prioritization process i.e. areas in which the development objectives of the City are readily achievable or may be expected to have the most significant impact i.e. within the constraints of limited financial resources.

C.2.1.4.3 Prioritisation Framework

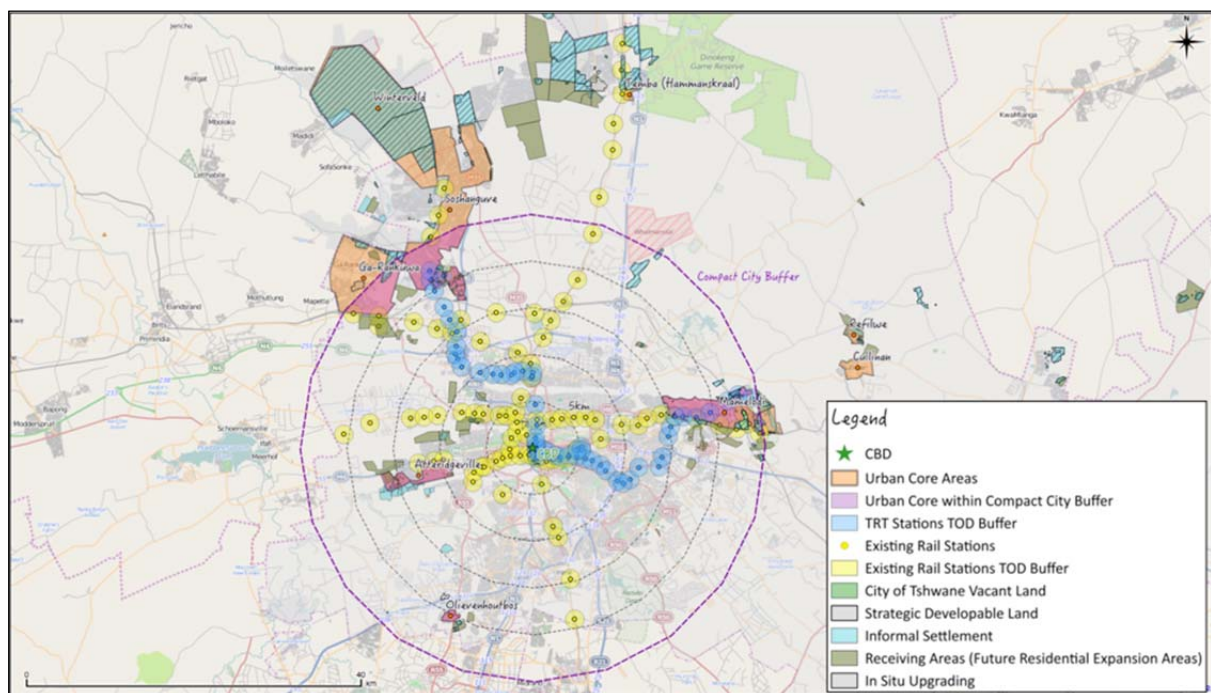
In line with principles outlined above, the following criteria formed the basis of the Urban Core Prioritisation:

- People: The community size within an Urban Core area reflects the potential number of beneficiaries of investment within that area. The larger the community size, the more favourably an area will be considered for investment.
- Access to basic services: The provision of basic services has been identified as a strategic objective of the City of Tshwane and a significant focus of infrastructure investment. Current access to basic services represents the need for basic services. The greater the need for basic services within an Urban Core, the higher the node will score within the prioritization framework. Similarly, the greater the level of poverty within an Urban Core, the greater the need for investment and the higher the node will likely score.
- Movement and connectivity: In line with the principles of Transit Orientated Development (TOD), transit precincts (both rail and TRT) within an Urban Core provide opportunities for focused and strategic investment. The more transit precincts within an Urban Core, the higher it is likely to be ranked. Where transit stations are still to be developed i.e. in the case of the TRT, TOD investment is best aligned with transit implementation and thus Urban Cores in which

development is to occur soonest will rate more highly. With reference to existing travel characteristics, the number of peak hour trips to and from an Urban Core reflect the travel demand of that node. The higher the demand for travel, the greater the impact of investment (i.e. improvement of public transport services, reductions in the need to travel etc.) and the higher the Urban Core will score. Travel time, a function of travel distance, also provides an indication of quality of services. The further removed commuters are from places of employment, the greater the need for improved transportation services or increased local employment opportunities.

- **Housing:** As in the case of basic services, residential housing backlogs provide an indication of the investment required within a particular area. The larger the housing backlog within an Urban Core, the higher it will likely score. Similarly, where greater opportunity exists to provide formal residential housing, the higher the score.
- **Land development opportunities:** Investment within the Urban Cores depends on the availability of land, particularly land that is located within strategic locations i.e. within TOD precincts, within the compact city buffer and in close proximity to the CBD. The larger the availability of land within such precincts, the higher the priority to capitalize investment.
- **Relationship with the CBD:** The closer an Urban Core is located within relation to the CBD, the greater the opportunity to align with the principles of the Compact City.

Figure C-3: Graphical Depiction of the Prioritisation Criteria



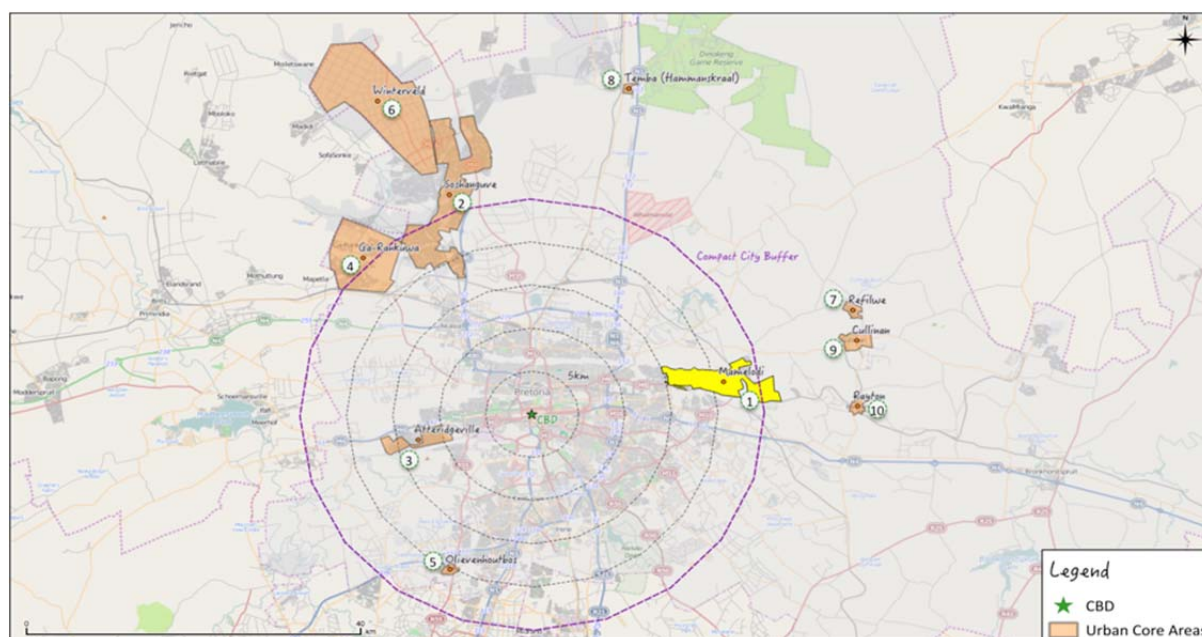
C.2.1.4.4 Prioritisation of the Urban Cores

With consideration of the prioritisation criteria, the Urban Cores were rated as follows:

Table C.2.1-2: Prioritisation of the Urban Cores

Urban Core	Ranking
Mamelodi	1
Soshanguve	2
Atteridgeville	3
Ga-Rankuwa	4
Olivenhoutbos	5
Winterveld	6
Refilwe	7
Temba	8
Cullinan	9
Rayton	10

Figure C-4: Prioritisation of the Urban Cores



In line with the relative rating of the Urban Cores, Mamelodi represents the Urban Core with the highest priority for Development Intervention Portfolios, followed by Soshanguve.

C.2.1.5 Prioritisation of TOD Precincts

C.2.1.5.1 Background

Public transport stations and interchanges play an important anchor role to many of the MSDF nodes, as these stations and interchanges increase the accessibility and walkability of these areas. Given this elevated level of accessibility / walkability, areas surrounding transit stations (referred to

as Transit Orientated Development Nodes) are similarly considered to be key nodal areas within the Urban Network Structure of the City of Tshwane i.e. they may also be considered as areas for focused infrastructure investment to support and facilitate increased land-use intensity, densification, economic development and growth and thus are eligible for DIPs preparation. It is therefore important to prioritise the different public transport-focused nodes / TOD precincts in order to determine where the DIPs process should focus next.

The Phase 1 of the IRPTN has been selected as the starting point for the TOD prioritisation exercise. The Phase 1 IRPTN consists of the following public transport stations or potential ToD precincts: (Refer to Figure C-5):

- Phase 1a – Line 2a: CBD to Hatfield
 - 2A-01: Nana Sita Street (between Paul Kruger and Thabo Sehume)
 - 2A-02: Nana Sita Street Intersecting with Sisulu Street
 - 2A-03: Kotze Street and Inez Street Intersection
 - 2A-04: Kotze Street at Bourke Street Intersection
 - 2A-05: Jorissen Street and Walton Jameson
 - 2A-06: Lynwood between Kirkness and University Street
 - 2A-07: Arcadia between Hilda and Grosvenor
 - 2A_S_08: Burnett Street (Hatfield Plaza) (Kerbside stop)
 - 2A_S_09: Burnett Street (PRASA) (Kerbside stop)
- Phase 1b – Line 1a: CBD to Mayville
 - 1A-01: Pretoria Station
 - 1A-02: Paul Kruger Street south of Church Square
 - 1A-03: Intersection of Paul Kruger between Struben Street and Johannes Ramokoase Street
 - 1A-04: Paul Kruger North of Boom Street
- Phase 1c – Line 1a: Mayville to Rainbow Junction and Line 2b: Hatfield to Menlyn
 - 2B-01: Lynnwood Road Between University Road and Roper Street
 - 2B-02: Lynnwood Road Between Duxbury Road and Pienaars Street
 - 2B-03: Lynnwood Road Between Ox Street and Kings Highway
 - 2B-04: Atterbury Road Between Lynwood Road and Seventh Street
 - 2B-05: Atterbury Road Corner Atterbury Road and Rosemary/11th Street
 - 2B-06: Atterbury Road Between N1 (National Road) and Lois Street
 - 2B-07: Atterbury Between Lois Street and January Masilela Road
 - 1A-05: Paul Kruger between Flower Street and Van Heerden Street
 - 1A-06: Mansfield Street between Louis Trichardt Street and Fred Nicholson Street

- 1A-07: Located off street on both sides of Paul Kruger Street (R101) at Wonderboom Station
- 1A-08: Rainbow Junction
- Phase 1d – Line 1c: Rainbow Junction to Akasia
 - 1B-01: Rachel de Beer Street between Emily Hobhouse Street and Ben Viljoen Street
 - 1B-02: Rachel de Beer Street between Daan de Wet Street and Narda Street
 - 1B-03: Rachel de Beer Street at Gafenheim Intersection at Shopping Centre
 - 1B-04: Rachel de Beer Street before Waterbok Street Intersection
 - 1B-05: Adjacent to Rachel de Beer and Willem Cruywagen Intersection
 - 1B-06: Heinrich Street between Brits Street and Doreg Street (Wonderpark Shopping Centre)
 - 1B-07: First Street between Doreen Road and Heinrich Street (adjacent to 1st Avenue)
- Phase 1e – Line 2d: Menlyn to Denneboom (Mamelodi West)
 - 2C-01: January Masilela Between Atterbury Road and Glenwood Street
 - 2C-02: Lynnwood Road Between Liz-Ann Street and Jacobson Street
 - 2C-03: Lynnwood Road Between Power Street and Simon Vermooten Road
 - 2C-04: Simon Vermooten Between Russouw Street and Furrow Road
 - 2C-05: Simon Vermooten Between Kent Street and Bronkhorstpruit/Pretoria Road
 - 2C-06: Simon Vermooten Road in vicinity of Alwyn Street Intersection
- Phase 1f – Line 2e: Akasia to Kopanong (Soshanguve) and Denneboom (Mamelodi West) to Mahube Valley
 - 1C-01: 1st Street between Doreen Avenue and Reginald Street (Orchards Suburb)
 - 1C-02: Doreen Avenue and Lynn Street (Orchards Suburb)
 - 1C-03: Doreen Avenue and Jensen Street
 - 1C-04: Doreen Avenue and Frans du Toit Ave (Rosslyn East Suburb)
 - 1C-05: Piet Rautenbach Street in Rosslyn Suburb
 - 1C-06: Doreen Avenue and Kirchoff Street (Rosslyn)
 - 1C-07: Doreen Avenue in Klip-Kruisfontein X4
 - 1C-08: Bakamoso Primary School (M20)
 - 1C-09: Hebron and M20
 - 1C-10: At Kopanong Railway Station
 - 2D-01: Tsamaya Between Dr. Ribiero and Dumsa Streets
 - 2D-02: Tsamaya Between Eerste Kgomo and Fabrieke Streets
 - 2D-03: Tsamaya Between Sibande and Tsomo Streets

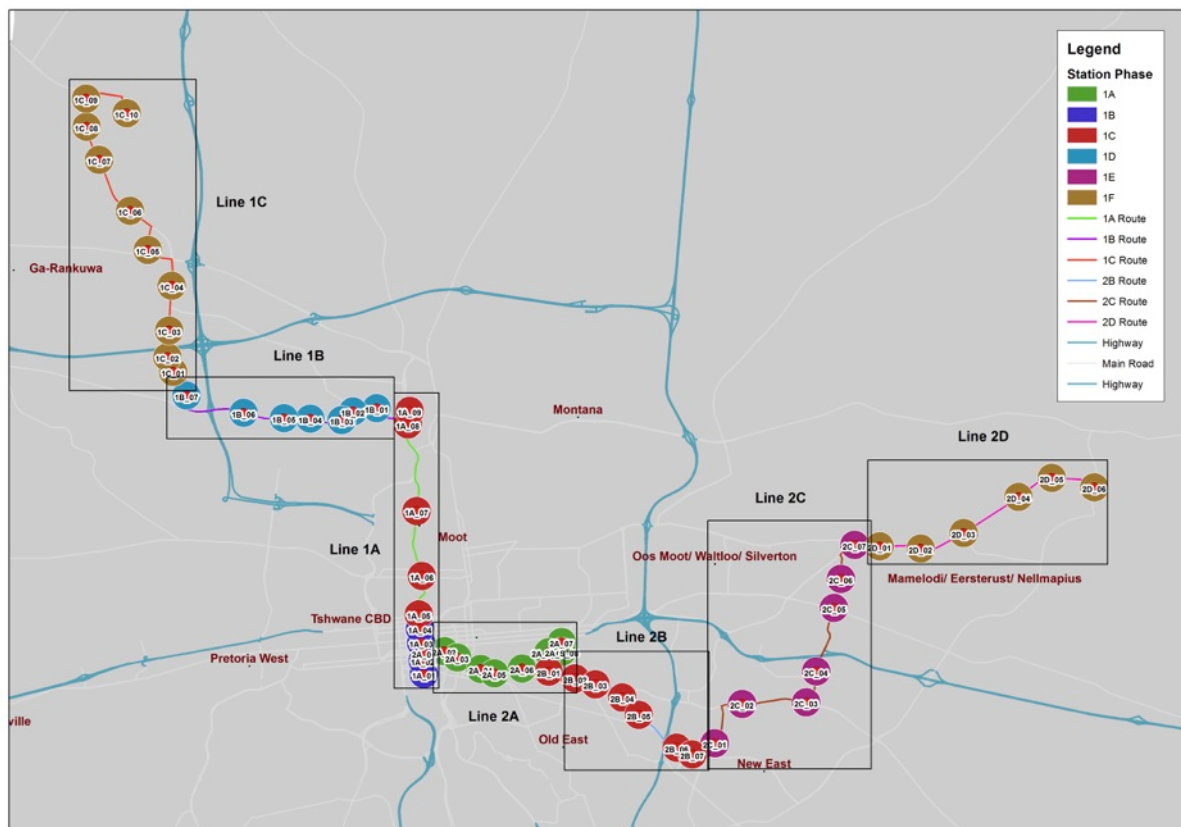
- 2D-04: Tsamaya Between Phatudi and Shilovhane Streets
- 2D-05: Tsamaya Between Letoba and J Maluleka Streets
- 2D-06: Solomon Mahlangu Between Tsamaya and J Maluleka

C.2.1.5.2 Prioritisation Framework

The principles and methodology used to prioritise the Urban Cores were similarly applied to determine the prioritisation of the respective Phase 1 IRPTN TOD Precincts. In so doing, the following criteria were similarly used to structure the prioritisation framework:

- People;
- Access to basic services;
- Movement and connectivity;
- Housing;
- Land development opportunities;
- Relationship with the CBD i.e. contribution to a compact city; and in addition
- Integration opportunities with the urban cores, metropolitan nodes, specialised nodes and mayoral priority areas.

Figure C-5: City of Tshwane IRPTN Phase 1 TOD Nodes



C.2.1.5.3 Prioritisation of the Phase 1 IRPTN TOD Precincts

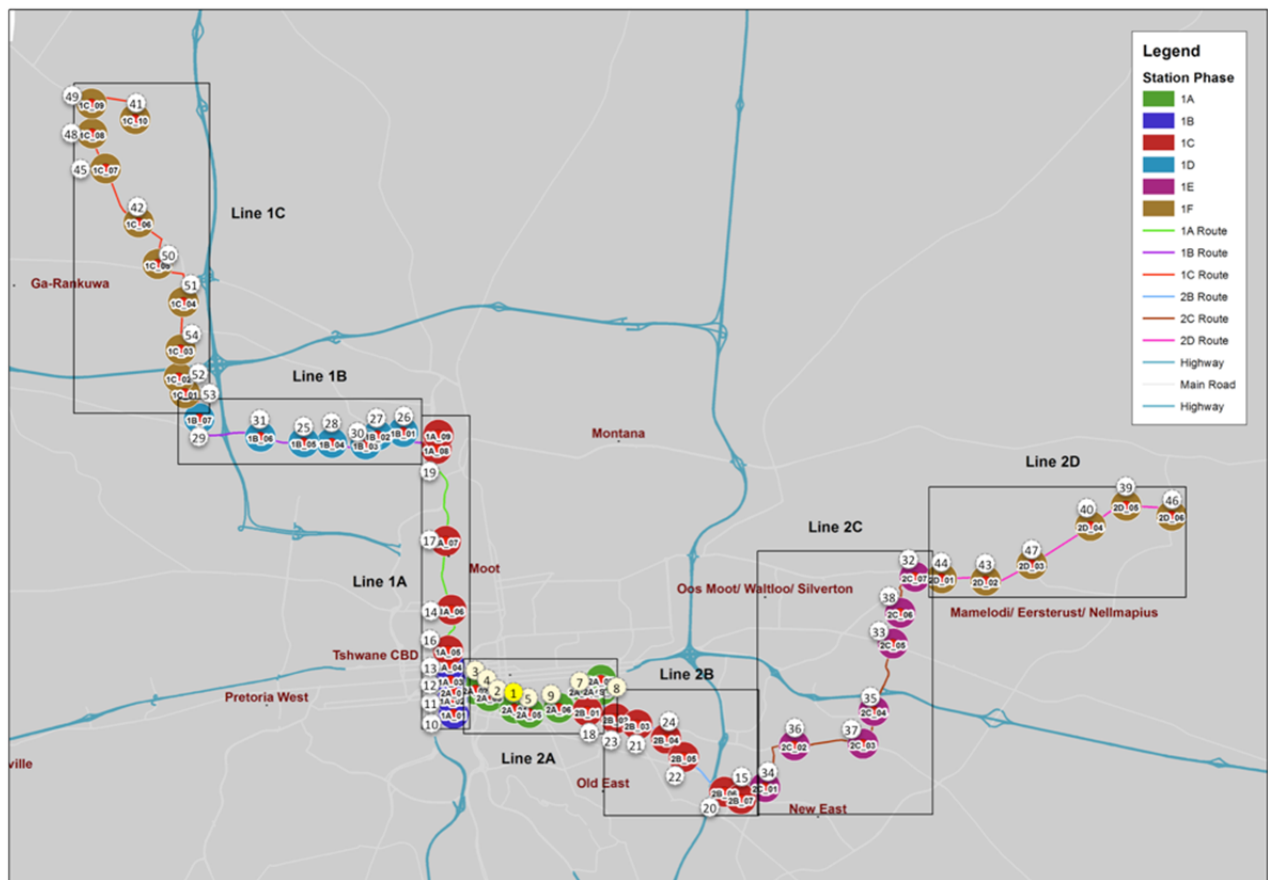
With consideration of the prioritisation criteria, the Urban Cores were subsequently rated as follows:

Table C.2.1-3: Prioritisation of the Phase 1 IRPTN TOD Precincts

Phase	No.	Precinct Name	Ranking
Phase 1a – Line 2a: CBD to Hatfield			
	2A-01	2A-01: Nana Sita Street (between Paul Kruger and Thabo Sehume)	3
	2A-02	2A-02: Nana Sita Street Intersecting with Sisulu Street	4
	2A-03	2A-03: Kotze Street and Inez Street Intersection	2
	2A-04	2A-04: Kotze Street at Bourke Street Intersection	1
	2A-05	2A-05: Jorissen Street and Walton Jameson	5
	2A-06	2A-06: Lynwood between Kirkness and University Street	9
	2A-07	2A-07: Arcadia between Hilda and Grosvenor	6
	2A_S_08	2A_S_08: Burnett Street (Hatfield Plaza) (Kerbside stop)	7
	2A_S_09	2A_S_09: Burnett Street (PRASA) (Kerbside stop)	8
Phase 1b – Line 1a: CBD to Mayville			
	1A-01	1A-01: Pretoria Station	10
	1A-02	1A-02: Paul Kruger Street south of Church Square	11
	1A-03	1A-03: Intersection of Paul Kruger between Struben Street and Johannes Ramokoase Street	12
	1A-04	1A-04: Paul Kruger North of Boom Street	13
Phase 1c – Line 1a: Mayville to Rainbow Junction and Line 2b: Hatfield to Menlyn			
	2B-01	2B-01: Lynnwood Road Between University Road and Roper Street	18
	2B-02	2B-02: Lynnwood Road Between Duxbury Road and Pienaars Street	23
	2B-03	2B-03: Lynnwood Road Between Ox Street and Kings Highway	21
	2B-04	2B-04: Atterbury Road Between Lynwood Road and Seventh Street	24
	2B-05	2B-05: Atterbury Road Corner Atterbury Road and Rosemary/11th Street	22
	2B-06	2B-06: Atterbury Road Between N1 (National Road) and Lois Street	20
	2B-07	2B-07: Atterbury Between Lois Street and January Masilela Road	15
	1A-05	1A-05: Paul Kruger between Flower Street and Van Heerden Street	16
	1A-06	1A-06: Mansfield Street between Louis Trichardt Street and Fred Nicholson Street	14
	1A-07	1A-07: Located off street on both sides of Paul Kruger Street (R101) at Wonderboom Station	17
	1A-08	1A-08: Rainbow Junction	19
Phase 1d – Line 1c: Rainbow Junction to Akasia			
	1B-01	1B-01: Rachel de Beer Street between Emily Hobhouse Street and Ben Viljoen Street	26
	1B-02	1B-02: Rachel de Beer Street between Daan de Wet Street and Narda Street	27
	1B-03	1B-03: Rachel de Beer Street at Gafenheim Intersection at Shopping Centre	30
	1B-04	1B-04: Rachel de Beer Street before Waterbok Street Intersection	28
	1B-05	1B-05: Adjacent to Rachel de Beer and Willem Cruywagen Intersection	25
	1B-06	1B-06: Heinrich Street between Brits Street and Doreg Street (Wonderpark Shopping Centre)	31
	1B-07	1B-07: First Street between Doreen Road and Heinrich Street (adjacent to 1st Avenue)	29

Phase	No.	Precinct Name	Ranking
Phase 1e – Line 2d: Menlyn to Denneboom (Mamelodi West)			
	2C-01	2C-01: January Masilela Between Atterbury Road and Glenwood Street	34
	2C-02	2C-02: Lynnwood Road Between Liz-Ann Street and Jacobson Street	36
	2C-03	2C-03: Lynnwood Road Between Power Street and Simon Vermooten Road	37
	2C-04	2C-04: Simon Vermooten Between Russouw Street and Furrow Road	35
	2C-05	2C-05: Simon Vermooten Between Kent Street and Bronkhorstpruit/Pretoria Road	33
	2C-06	2C-06: Simon Vermooten Road in vicinity of Alwyn Street Intersection	38
Phase 1f – Line 2e: Akasia to Kopanong (Soshanguve) and Denneboom (Mamelodi West) to Mahube Valley			
	1C-01	1C-01: 1st Street between Doreen Avenue and Reginald Street (Orchards Suburb)	53
	1C-02	1C-02: Doreen Avenue and Lynn Street (Orchards Suburb)	52
	1C-03	1C-03: Doreen Avenue and Jensen Street	54
	1C-04	1C-04: Doreen Avenue and Frans du Toit Ave (Rosslyn East Suburb)	51
	1C-05	1C-05: Piet Rautenbach Street in Rosslyn Suburb	50
	1C-06	1C-06: Doreen Avenue and Kirchoff Street (Rosslyn)	42
	1C-07	1C-07: Doreen Avenue in Klip-Kruisfontein X4	45
	1C-08	1C-08: Bakamoso Primary School (M20)	48
	1C-09	1C-09: Hebron and M20	49
	1C-10	1C-10: At Kopanong Railway Station	41
	2D-01	2D-01: Tsamaya Between Dr. Ribiero and Dumsa Streets	44
	2D-02	2D-02: Tsamaya Between Eerste Kgomo and Fabrieke Streets	43
	2D-03	2D-03: Tsamaya Between Sibande and Tsomo Streets	47
	2D-04	2D-04: Tsamaya Between Phatudi and Shilovhane Streets	40
	2D-05	2D-05: Tsamaya Between Letoba and J Maluleka Streets	39
	2D-06	2D-06: Solomon Mahlangu Between Tsamaya and J Maluleka	46

Figure C-6: Prioritisation of the Phase 1 IRPTN TOD Precincts



C.2.2 Precinct Planning and Management

BEPP Content Guidelines – as per BEPP Guidance Note 2015/16-2017/18

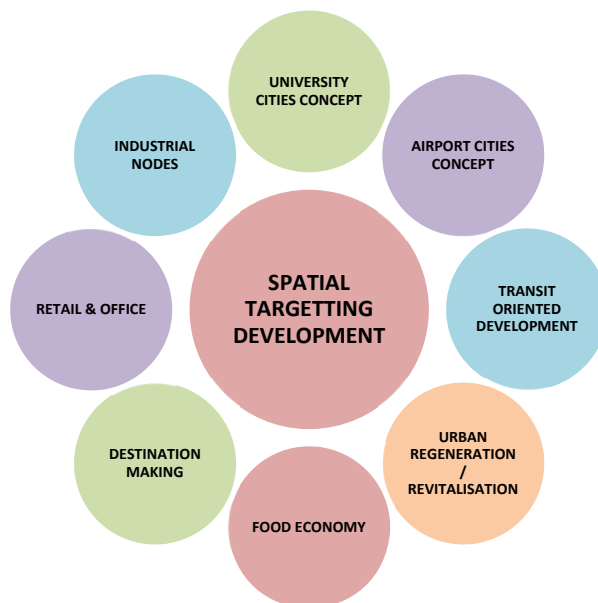
This section of the BEPP should seek to:



- Provide details of proposed or completed adjustments since 2013/14 to the determination of spatial targeting instruments (PHDAs, SHRZs, UDZs, IDZs, SEZs, etc.) applicable to each Integration Zone
- Provide details on adjustments since 2013/14 to Spatial Development Frameworks and Land Use Management System, and where relevant By-Laws and Regulations applicable to each Integration Zone

Following on the identification of prioritised areas for intervention, and with consideration of the City's transformation agenda and priority spatial development strategies, spatial planning concepts have been identified to guide capital investment within the City – refer to Figure C-7.

Figure C-7: Spatial Planning Concepts Underpinning the Spatial Capital Investment-Targeting Map



A spatial capital investment-targeting map has since been generated which depicts these concepts in relation to priority investment areas. In so doing, this map indicates where capital investment should be focussed to achieve the desire outcomes envisaged in the Tshwane Vision 2055, the MSDF and the RSDF documents.

The rationale for each of the spatial planning concepts underpinning the spatial capital investment-targeting map is tabulated below with the optimal localities provided in each of the Tshwane planning regions.

Table C.2.2-1: Spatial Planning Concepts Underpinning the Spatial Capital Investment-Targeting Map

DESCRIPTION	LOCALITY	REGION
UNIVERSITY CITY CONCEPT		
<i>Spatial</i> response to this Growth Path: Includes Knowledge economies	University of Pretoria in Hatfield, Medical University of Southern Africa (Medunsa) in Ga-Rankuwa The Tshwane University of Technology (TUT) in the CBD, University of South Africa (UNISA), Muckleneuk	Region 3, Region 1
There are nodes within the metropolitan area that are characterised by largely mono-functional land uses taking up large, concentrated and defined space such as educational and research institutions.		
It is important to acknowledge these specialised activity areas not just in terms of their scale, but because of their sphere of influence in terms of generating movement, opportunities and linkages with other areas. These linkages do not only refer to physical linkages, but also to “connectivity” in a broader sense, such as between institutions of learning and research - Research, Innovation, Education and Technology Institutes.		
T2055 envisions Tshwane developing into a world-class knowledge based economy. Universities are an important component of the knowledge-based economy. Tshwane is home to a number of universities and other supporting tertiary and/or research institutions and can thus be defined as a university city.		
A <i>university city</i> is a city that is either dominated by its university population or accommodates a significant community, neighbourhood or district. The university may be large, or there may be several smaller institutions that are clustered together in such a way that they make up a coherent neighbourhood or precinct. The very presence of the educational institution(s) pervades economic and social life. Many local residents may be employed by or skilled as a result of the university. Many businesses within the university precinct will mostly cater primarily to the university and its students.		
Benefits of giving impetus to the University City concept are: Attracting a skilled workforce Retaining a skilled workforce The skilled workforce adds value to the ‘image of the local community’ further attracting investment and tourism Stimulating innovation, research and development towards achieving the Smart City Concept		
Movement and Accessibility through an affordable public transport system and/or pedestrian and cyclist-friendly urban systems. Functionality of precincts through significant landmarks that provide orientation cues and signage that assists in way finding. City Image through spaces that create a ‘personality’ for the city. Recreation, arts and culture through the hosting of several cultural events, vibrant nightlife and a choice of activities for those with varied interests.		
AIRPORT CITY CONCEPT		
An aerotropolis is a node whereby development is centred around an airport. It is similar in form and function to a traditional metropolis,	Wonderboom Airport	Region 2

which contains a central city core and its surrounding complementary neighbourhoods.		
Can be defined as a multi-faceted metropolitan powerhouses that attracts new businesses, create new jobs and open new commercial possibilities, introducing a vibrant business model that can accommodate intensive air travel.		
Draft Gauteng Transport Master Plan 2013: Lanseria International and Wonderboom Airports should support ORTIA with scheduled domestic flights and international flights into Sub-Saharan Africa		
TOD, Housing, Industrial and Retail and commercial node development to be accommodated in and around the area		

TRANSIT ORIENTATED DEVELOPMENT		
Target users to access the node	Pretoria Station, Centurion CBD,	Region 1, 2, 3, 4 and 6
While Tshwane has a comprehensive system of higher order mobility routes and development corridors, there are still several localities that are not adequately catered for.	Hammanskraal CBD, Mabopane CBD, Soshanguve South Station/Kopanong, Atteridgeville/Saulsville, Mamelodi	
Goes beyond implementation of routes to include means of transportation that is rapid, efficient, reliable, convenient safe and attractive. Public transit has not been providing an attractive commuting alternative for those who can afford private travel options.		
Integrated Rapid Public Transport Network		
A rapid and frequent transit service		
High accessibility to the transit station		
A mix and clustering of residential, retail, commercial and community uses		
High-quality public spaces and streets which are pedestrian and cyclist friendly		
Medium to high density development within 800 metres of a transit station		
Reduced rates of private car parking		
Incorporates densification, intensification and compaction of mixed land use in close (walking distance) proximity to significant transit connections. The intention of TOD is to maximise the potential of developed land, create the population threshold required for sufficient ridership of public transport, reduce the carbon footprint by combating sprawl and promoting pedestrianism thus reducing reliance on private vehicle usage and creating vibrant 24-hour centres that provide sustainable human settlements		
<i>Transit Oriented Zones:</i> Transit Promotion Zones refer to those nodes that are centred on transportation nodes or facilities, such as stations, highway interchanges and other modal inter-changes. Transit Promotion Nodes could be part of High Density Zones or Corridors where such zones also incorporate a major transport facility.		
Conceptual Framework: For the principles to be incorporated into fundamental objectives and strategic direction, the following concepts were developed: Smart growth Urban design Increased access and mobility “green” development Traditional Public transport and alternative/innovative public transport		

Choice and convenience		
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URBAN REGENERATION		
<p>Urban regeneration/renewal is “certainly a process of slum clearance” as much as it is the clearance of obsolete buildings used by slum dwellers.</p> <p>To create:</p> <p>Safer City</p> <p>Inclusive City</p> <p>Accessible city</p> <p>Attractive City</p> <p>Investment Friendly city</p>	The Inner City (Pretoria CBD)	Region 3
<p>Target Areas:</p> <p>Identity</p> <p>High profile developments</p> <p>Informal Trading solutions</p> <p>Range of housing opportunities</p> <p>Residential Support Facilities</p> <p>Tourism, entertainment and recreational opportunities</p> <p>Public Transport System</p> <p>Pedestrian Friendly</p> <p>Public Spaces</p> <p>Safety</p> <p>Financing</p>		

FOOD ECONOMY		
The NDP 2030 highlights the importance of rural areas, reminding us that despite population shifts from rural to urban areas, the health and wellbeing of the entire population still depends on rural goods and services- food, water, minerals, energy, biodiversity, natural and cultural experiences, labour and land- and this will become increasingly clear in the next few decades, as resources become more constrained		Regions 2, 5 and 7
The GSDF identifies Agricultural Hubs within Regions 2, 5 and 7, all with varying degrees of agricultural potential. These regions incorporate the largest part of the rural areas of Tshwane		
Agricultural land use encompasses purposes normally associated or reasonably required in connection with agricultural purposes and agri-villages.		
Land specifically identified as high potential farmland for productive and sustainable commercial agriculture (i.e. the cultivation of crops, rearing of livestock, extensive game farming, as well as processing of agricultural products should be protected from development and suburban encroachment. These areas are highly suitable for agricultural use and must not be seen as mere vacant land waiting for development. The availability of water is however an important factor for the viability of this activity		
Agriculture is a function of both food security and economic growth. Agriculture, if implemented sustainably, is an important tool in ensuring food security. Food security exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food which meets their dietary needs and food preferences for an active healthy life” (CoT Integrated Food Security Policy). The Policy documents the threat of increasing poverty across an ever		

growing Tshwane population and the challenge of ensuring food availability under these circumstances.		
Problems associated with food insecurity specific to the CoT can be attributed to the following determinants: Food availability, Food accessibility, Inadequate safety nets, Food safety and nutrition, Weak information management system		
Strategies to overcome these challenges include the following: Promoting food production and trade (urban and peri-urban agriculture) Promoting income generation and job creation Building adequate safety nets including basic services, food bank, etc. Promoting food safety and nutrition		
Draft Integrated Agricultural Development Support Strategy focus on the following: Food security and poverty eradication Empowerment of the farmer and increased incomes Promotion of agro-diversification including value addition and trade Sustainable Partnerships Sustainable agriculture		

DESTINATION MAKING		
<p>A great destination has local appeal and attract interest from outside - for business or leisure - It is somewhere people want to live, work and invest.</p> <p>ATTRACTORS create awareness of the destination and attract market interest. Including iconic buildings, natural features, retail, leisure and cultural facilities, and events</p> <p>INFRASTRUCTURE - create a sense of place and supports smooth operation of the destination e.g. transport, parking, signage, public spaces</p> <p>SERVICES cater to visitors' and residents' needs, help create activity and, ultimately, increase spending. They include hotels, cafés, bars, shops, event programmes, and services such as cleaning, security and customer care</p> <p>The destination's BRAND captures all these elements of the destination experience and presents it to its markets</p> <p>Integrated MANAGEMENT of the destination is important to long term success. This includes:</p> <p>Planning, development, operations, branding and marketing</p> <p>City's built form including buildings and public spaces</p> <p>Cultural heritage</p> <p>Historical buildings and places</p> <p>Symbolic locations</p> <p>Landmarks</p> <p>Natural elements</p>	<p>Tshwane initiatives – Inner City Regeneration</p> <p>Tshwane Tourism belt - Circle of Pride</p> <p>Combining tourism, Public Transport and Place making initiatives</p> <p>Inner City Attractions include - Union Buildings, Church Square, Marabastad, Melrose House, Freedom Park</p> <p>Other include – Tswaing Crater, Rietvlei Dam Nature Reserve, Voortrekker Monument, National Botanical Gardens, Dinokeng and Cullinan</p>	

RETAIL AND OFFICE DEVELOPMENT		
<p>Retail Development</p> <p>A form of economic activity that should:</p> <p>Depending on it's type and scale, be appropriate for its location</p> <p>Depending on it's type and scale, make provision for public transport (e.g. drop-off bays, parking for public transport, safe access of public transport users from transportation to shopping centre)</p>	<p>Menlyn: Menlyn Maine Proposal</p> <p>Centurion</p> <p>Akasia</p> <p>CBD</p>	

Cater for informal trade in an integrated and formal manner Add value to the aesthetic quality of the built environment Be sensitive to the natural environment		
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INDUSTRIAL NODES		
There are nodes within the metropolitan area that are characterised by largely mono-functional land uses taking up large, concentrated and defined space. It is important to acknowledge these specialised activity areas not just in terms of their scale, but because of their sphere of influence in terms of generating movement, opportunities and linkages with other areas. These linkages do not only refer to physical linkages, but also to “connectivity” in a broader sense, such as between institutions of learning and research. Specialised Activity Areas include such areas as: Industrial Estates	Babelegi Ga-Rankuwa Watloo Ekandustria Sunderland Ridge	
Tshwane Vision 2055: Produce a meaningful and sustainable change toward poverty eradication. The history of efforts to eradicate poverty emphatically demonstrates that we cannot effectively do so without transforming the existing patterns of accumulation and distribution of wealth. Hence any sensible attempt to eradicate poverty should aim at altering the ideological, material and institutional basis of the current social systems, including the patterns of production, distribution and consumption. Although the Census 2011 suggests that the city has one the lowest rates of unemployment levels in the country; the city continues to seek ways of defeating this scourge It's only through increased investment that the city will be able to produce more enduring decent employment opportunities. An enabling climate for investment is critical for economic growth and social development within the City		

Intended outcomes of the spatial strategy of applying the above principles within the spatial context are:

- Improved service delivery through impactful infrastructure investment in strategically located areas of the city
- Reduced carbon footprint through nodal development
- Increased investment in the city through improved global liveability rating
- Reduced pressure on agricultural and conservation land through optimal use of land
- Reduced cost of living through as a result of transit-oriented development thus reducing travel time, cost and distance
- Increased options in housing typology (structure and cost), addressing various income groups and integrating various communities

- Improved quality of life for Tshwane residents through convenience of increased access to goods and services within nodal areas supported by an efficient and integrated public transport system
- Reduced cost of delivery services by facilitating the sharing of resources (public facilities, services, equipment) through nodal development.

The spatial capital investment targeting map, as well as the spatial planning concepts that underpins it will become a critical input to guide prioritised investment within the City. The key spatial layers emanating from the spatial planning concepts described above and that form part of the Spatial Capital Investment-Targeting Map include, but are not limited to, the following:

- Public Transport Movement Network, which supports the Transit Oriented Development through corridor development, comprises of:
 - TRT Phase 1 per implementation phase (TRT Phase 1a, TRT Phase 1b, TRT Phase 1c, TRT Phase 1d, TRT Phase 1e, TRT Phase 1f) (0.5km buffer)
 - CBD Ring Rail (0.5km buffer)
 - Future IRPTN Individual Lines (0.5km buffer)
- Transit Oriented Development (TOD) Precincts
 - Intermodal Station Precincts
 - This is planned around Intermodal Facilities around Gautrain stations. The zone covers a buffer of 1.5km radius buffer for both existing and future stations.
 - TRT Station Precincts
 - These consist of a 1km radius buffer around the stations.
 - PRASA Station Precincts
 - These consist of a 1km radius buffer around the PRASA stations. According to the PRASA masterplan, the stations are divided into 3 categories i.e. Priority A, Priority B and Priority C.
- MSDF Nodal Hierarchy
 - Capital Core (CBD)
 - Metropolitan Nodes
 - Urban Cores (Urban Regeneration / Revitalisation Zones)

- Industrial Nodes
- MSDF Spatial Programmes

This comprises of transport and roads as follows:

- PWV Network (500m buffer)
 - K-routes (500m buffer)
 - Highways (Existing and Proposed - 500m buffer)
 - Activity Spines (Existing and Proposed - 500m buffer)
 - Activity Street (Existing and Proposed - 500m buffer)
 - Mobility Spine (Existing and Proposed - 500m buffer)
 - Mobility Road (Existing and Proposed - 500m buffer)
 - Human Settlements / Housing
- This is composed of both new housing project areas and MSDF future development areas.
- Social Development / SRAC
- Social development backlog areas based on the CSIR Public Amenity Norms and Standards Analysis focusing on the following facilities:
- Clinics
 - Libraries
 - Community halls and facilities
 - Education facilities (i.e. pre-primary, primary and secondary schools)
 - Emergency Services/ TMPD
- Emergency services backlog areas based on a 15-minute travel time isochrones service area analysis around the following emergency service facilities:
- Police Stations
 - Fire Stations
 - Hospitals / Emergency Wards / Clinics
 - Strategic Investment Zones / Specialized Nodes

The following Strategic Investment Zones or Specialised Nodes are conceived in the MSDF:

- Destination Making
 - MSDF Tourism Potential Zones
 - Northern Tourism Destination Belt
 - Catalytic Precincts
 - Salvokop / Freedom Park Node
 - Dinokeng Eco-tourism Area
 - Tshwane Dam
- University Cities Concept
- Tertiary Education Facilities
- Food Economy
- Agricultural Land-use Polygon
- Airport Cities Concept / MSDF Airport Nodes
- Service Infrastructure

Basic infrastructure services backlog areas defined in accordance with the following master plans:

 - Roads and Stormwater master plan
 - Water and sanitation master plan
 - Energy and electricity master plan

The Spatial Capital Investment Targeting Map is shown in Figure C-8. Owing to the complexity of the map and the variety of spatial layers which intersection one another, a Spatial Capital Investment Targeting Map was prepared for each of the seven (7) Tshwane Planning Regions, which are shown in Figure C-9 through Figure C-15.

Figure C-8: City of Tshwane Spatial Capital Investment-Targeting Map

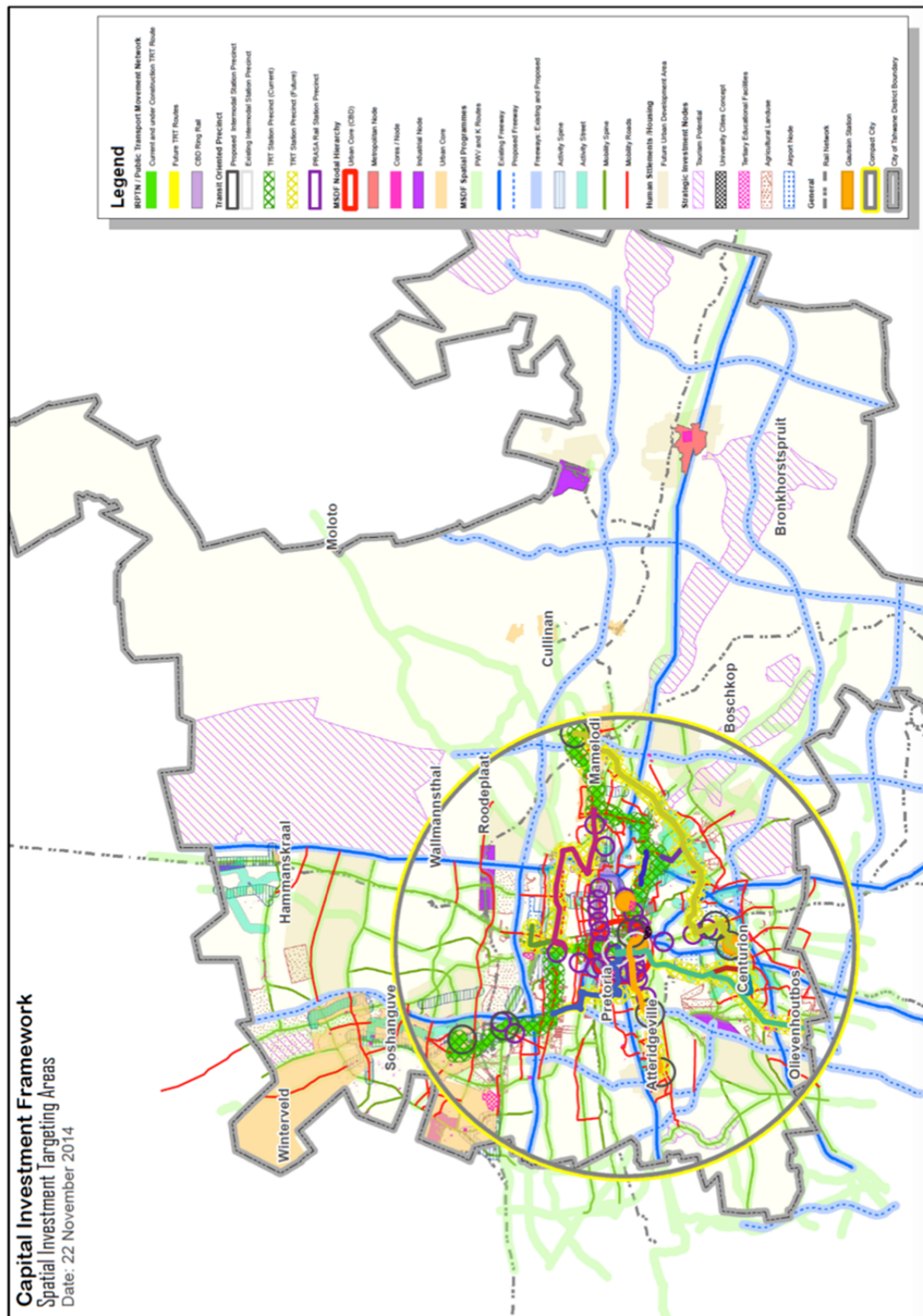


Figure C-9: Spatial Capital Investment-Targeting Map – Region 1

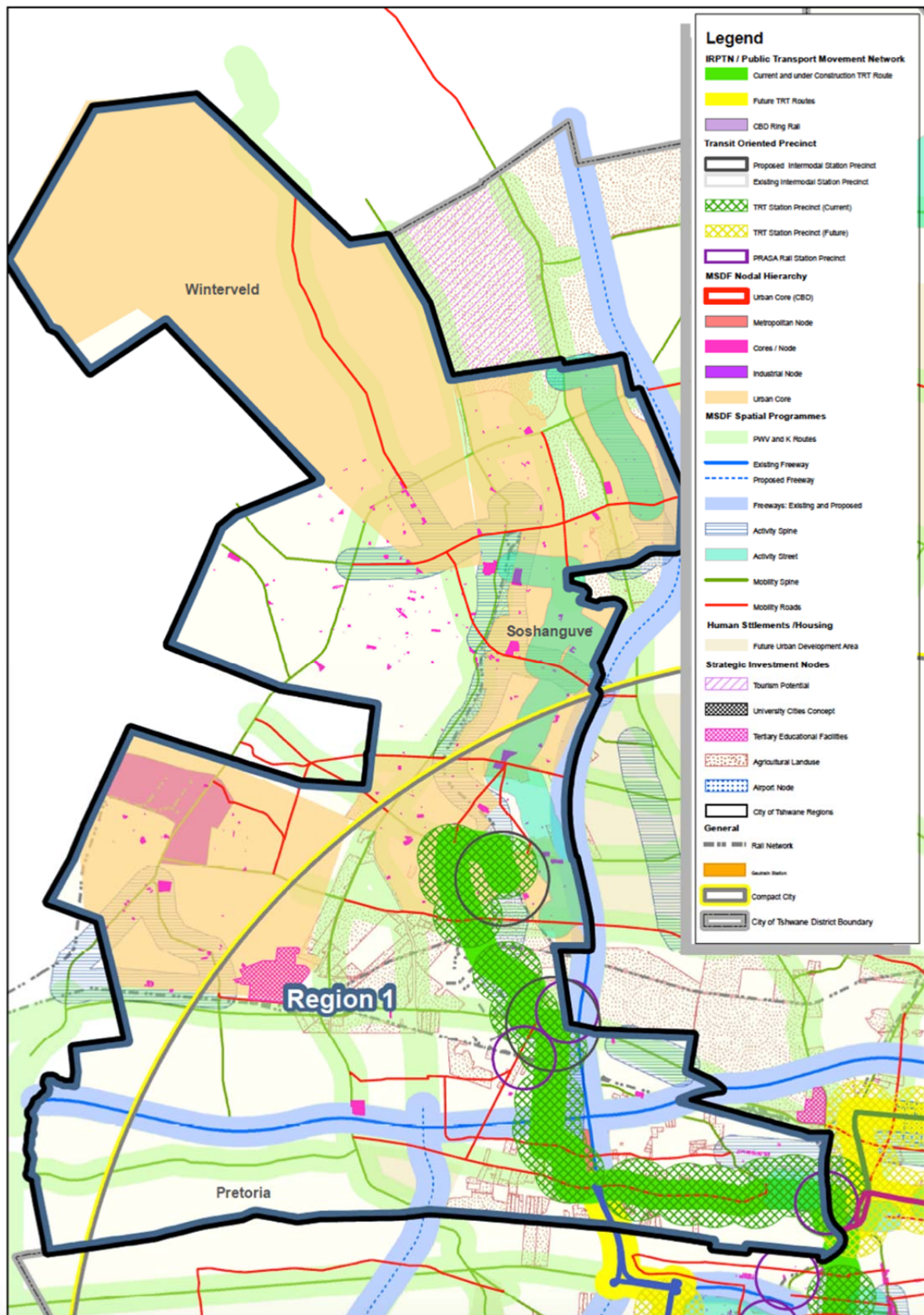


Figure C-10: Spatial Capital Investment-Targeting Map – Region 2

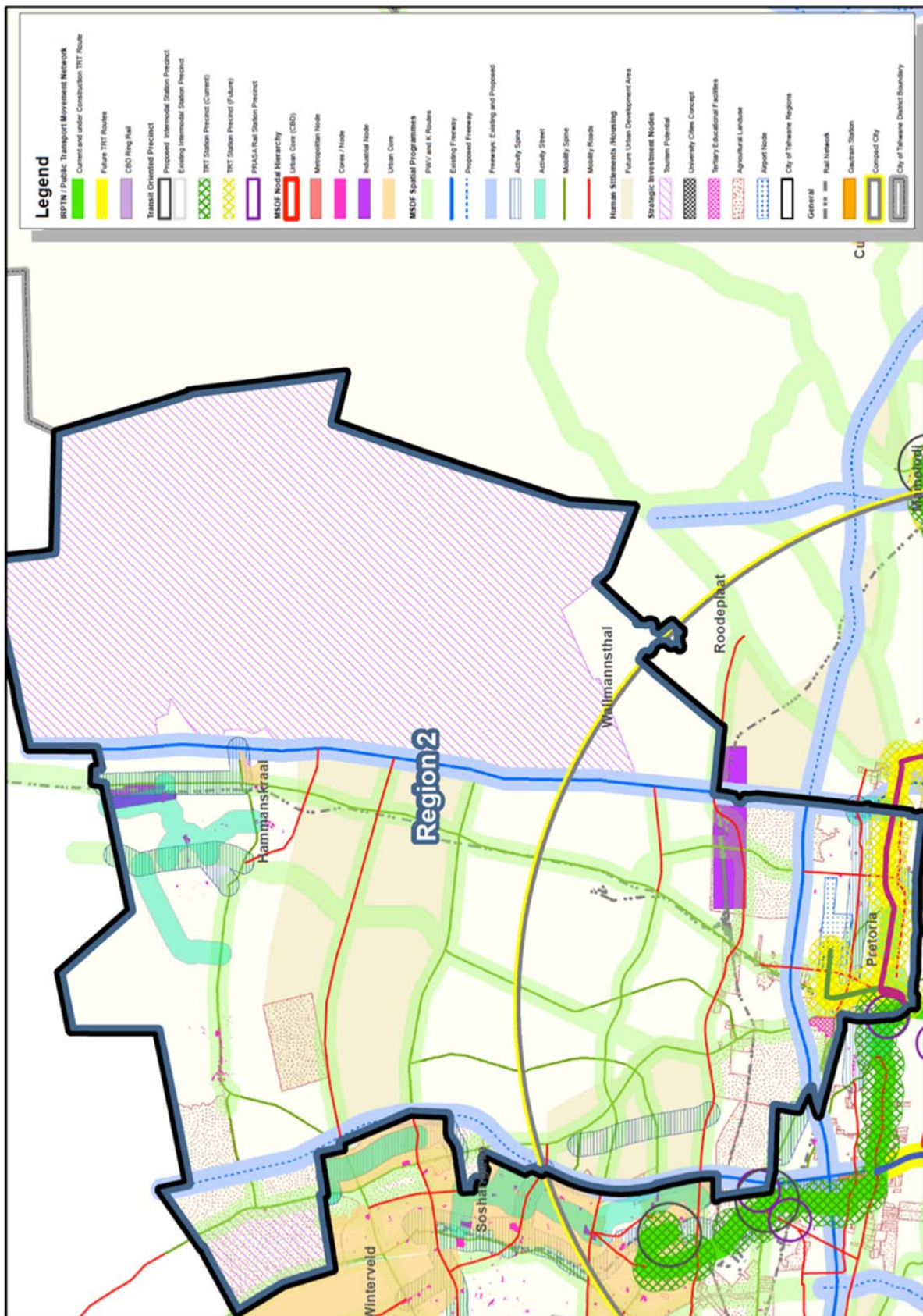


Figure C-11: Spatial Capital Investment-Targeting Map – Region 3

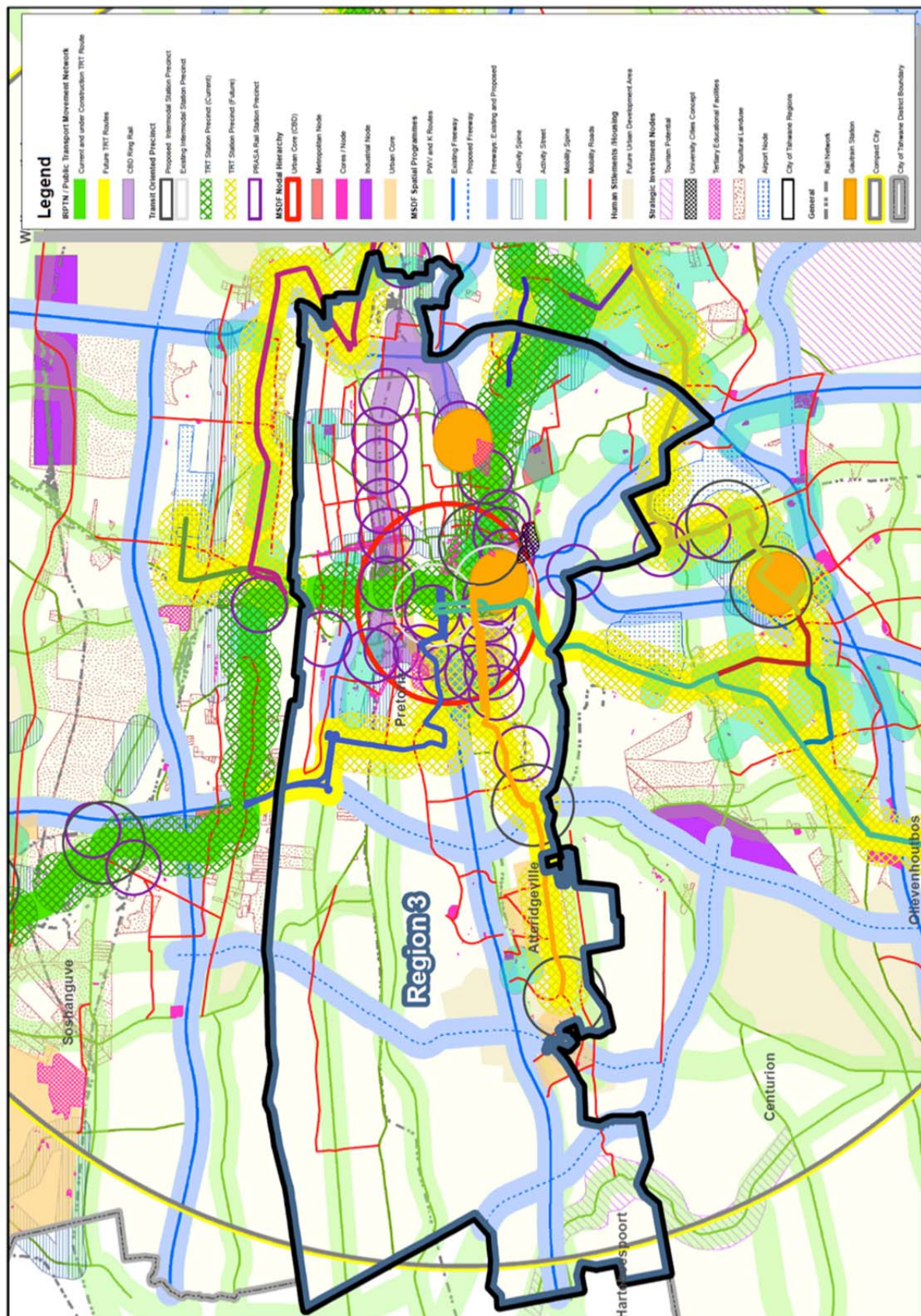


Figure C-12: Spatial Capital Investment-Targeting Map – Region 4

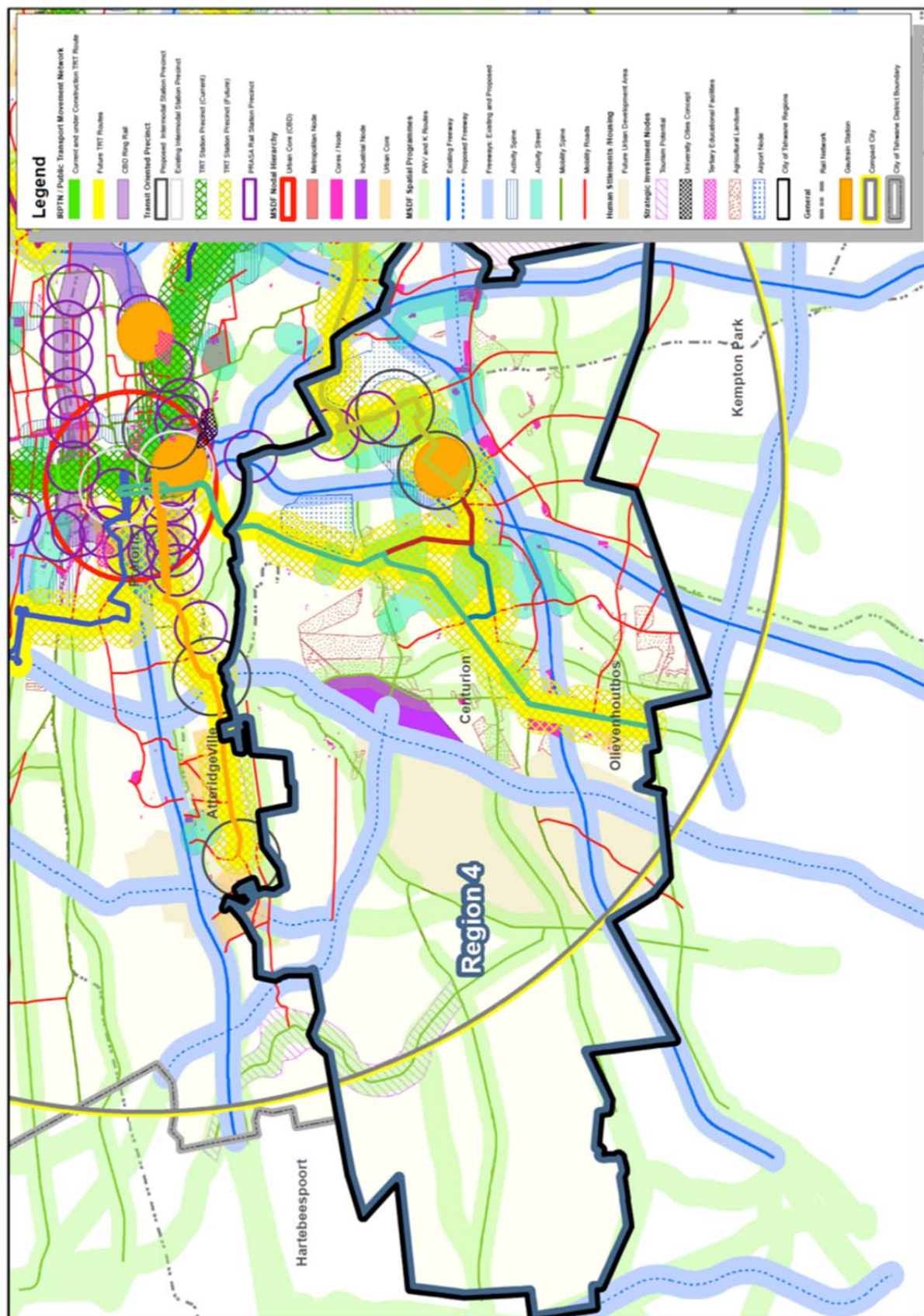


Figure C-13: Spatial Capital Investment-Targeting Map – Region 5

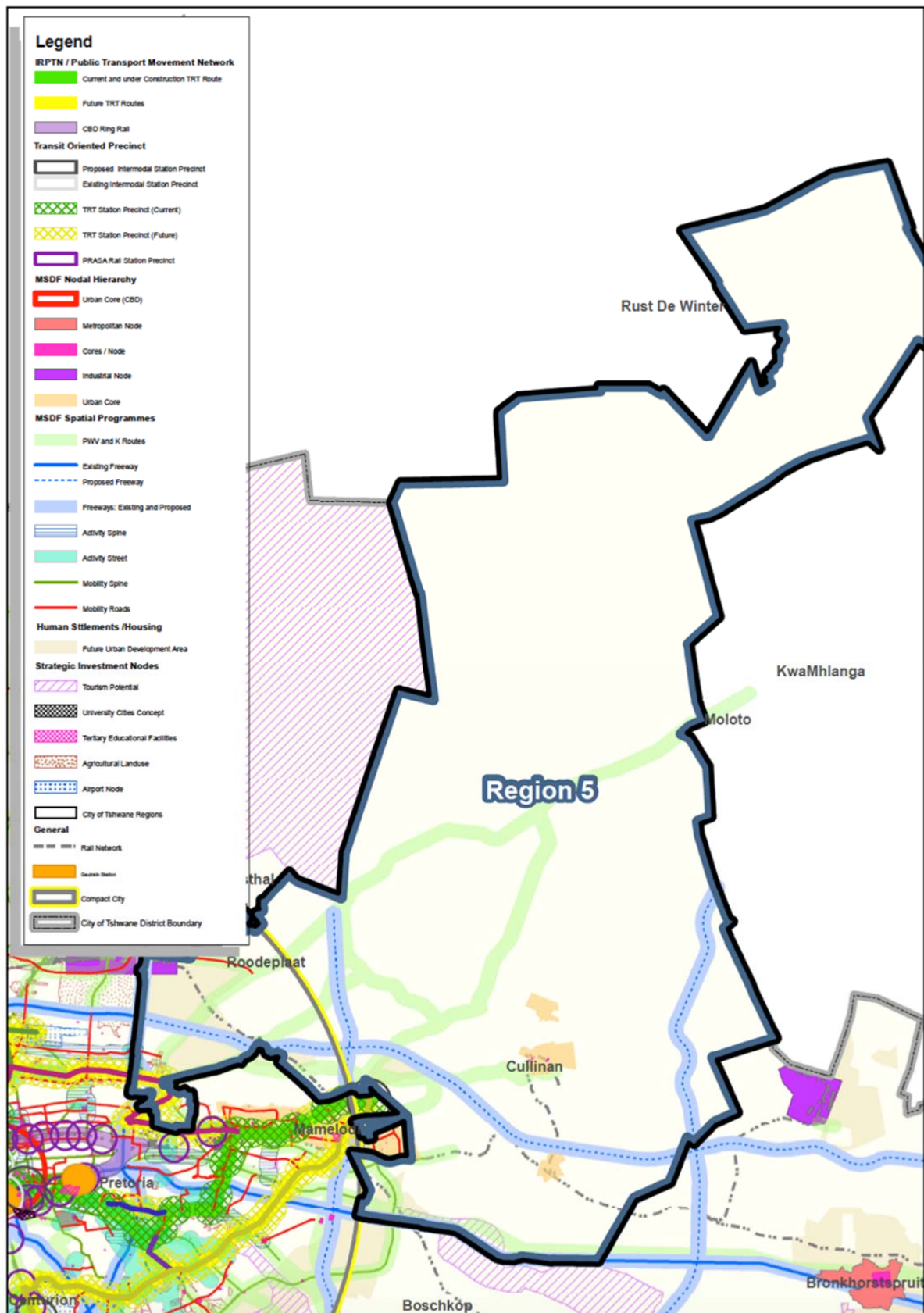


Figure C-14: Spatial Capital Investment-Targeting Map – Region 6

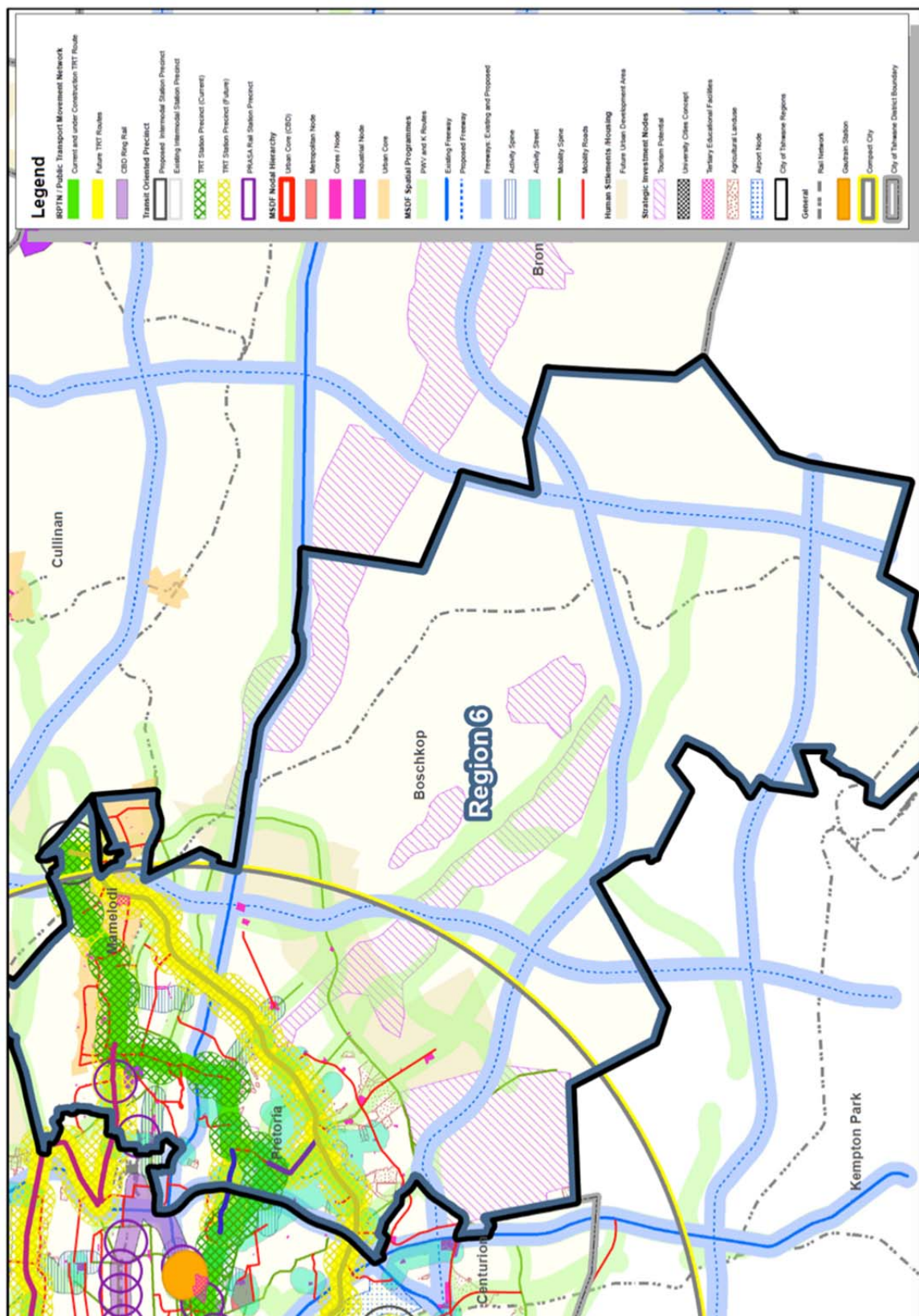
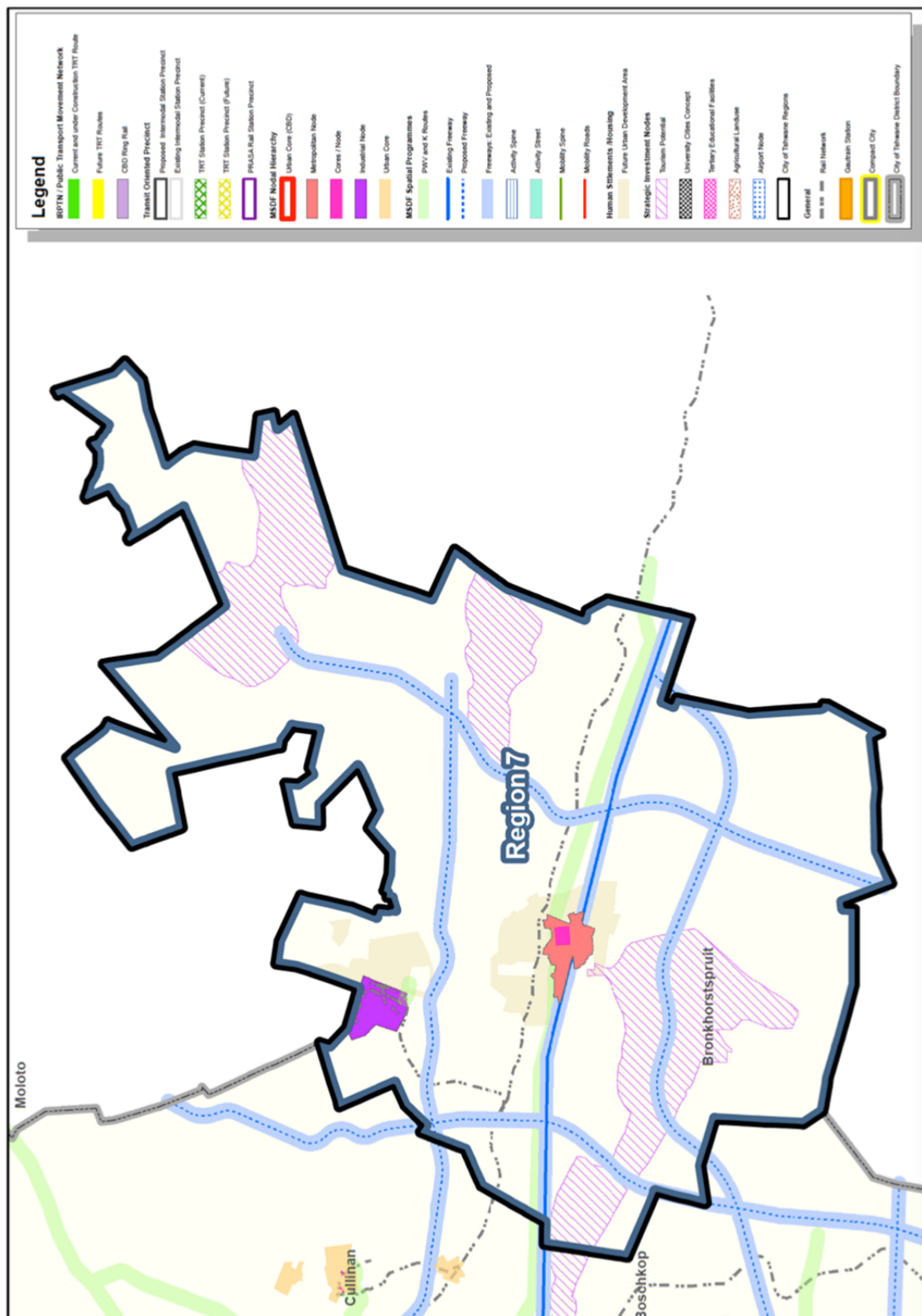


Figure C-15: Spatial Capital Investment-Targeting Map – Region 7



C.2.3 Preparation of Catalytic Urban Development Projects within Integration Zones

BEPP Content Guidelines – as per BEPP Guidance Note 2015/16-2017/18

This section of the BEPP should seek to:

- Provide details of the identification of catalytic urban development projects or programmes by prioritised Integration Zone illustrating the intervention, sequencing, budget allocation and funding source. Each catalytic project or programme must be identified with a network element i.e.
 - CBD
 - Urban Hub/Node
 - Transport Link and Activity Corridor
- Unpack developmental strategies for each Integration Zone, including core objectives and instruments.
- Provide details of institutional arrangements required to ensure the sustainability of interventions applicable to each Integration Zone
- Provide proposed time frames for the preparation and execution of catalytic urban development projects and programmes.

C.2.3.1 Project Preparation

Within the context of the Package of Plans (as depicted in Figure C-16), Development Intervention Portfolios follow from the RSDF and are medium-to-long term development plans and implementation strategies that are seen to bridge the Local Spatial Development Framework and the Precinct Plan. In so doing, DIPs represent the mechanism through which projects are identified within key nodal areas, precincts and development corridors. The intention is to pro-actively structure and optimise development so as to catalyse economic investment and growth, improve the sustainability and resilience of the City, and provide its beneficiaries with inclusive and accessible opportunities within an increasingly liveable environment. In line with this, the specific objective of the DIPs is to:

- Interpret the strategic vision for the City of Tshwane (Tshwane 2055) with specific reference to the context of Mamelodi.

- In line with this vision, detail a comprehensive plan for development. The intention is that this plan build upon and consolidate the proposals of the MSDF and the RSDF, as well as any other existing development proposals emanating from previous studies.
- Identify the enabling factors required to facilitate and support development (i.e. required bulk infrastructure, transport infrastructure, social amenities etc.).
- Translate these plans into tangible projects;
- Link these proposals to targets and implementation programmes; and to
- Package the above in a form that may be used to solicit investment interest.

In so doing, the DIPs are therefore engineered to enhance the project preparation methodology of the City of Tshwane

PLANNING DOCUMENTS

Tshwane Vision 2055

Tshwane Vision 2055 provides an overarching strategic vision for the City of Tshwane that serves to guide growth and development and serve as a point of reference for future intervention, priorities and strategies.

Metropolitan Spatial Development Framework

The MSDF provides a spatial representation of the City's vision and spatial transformation agenda. In so doing, the MSDF outlines spatial planning directives, as well as spatial development concepts.

Regional Spatial Development Frameworks

RSDFs follow directly from the MSDF and expand on the spatial development concepts on a regional scale to provide an overall development structure, including key structuring elements and broad zones for development, in addition to identifying specific intentions for development in line with spatial planning directives.

Local Spatial Development Frameworks

LSDFs provide detail to the RSDF on a more localised scale by defining specific development opportunities within an area and the spatial structuring mechanisms required to unlock them. At the LSDF level the desired built form is defined, broad development guidelines are proposed, and spatial interventions are identified.

Precinct Plans

Precinct plans focus on a small scale area, node or corridor. The intention of a precinct plan is to provide spatial form and detail to the proposals of the LSDF. Precinct plans generally include more detailed design guidelines and proposed development controls, as well as an action plan for the implementation of projects within the precinct.

BUDGET AND IMPLEMENTATION PLANS

Capital Investment Framework

The Capital Investment Framework forms a part of the MSDF and seeks to guide and inform capital expenditure within the City in alignment with the spatial policies and directives.

Integrated Development Plan

The IDP is the principle strategic planning instrument that guides and informs all planning and development within the City over a five year period. The MSDF and CIF form a core component of the IDP.

Service Delivery and Budget Implementation Plan

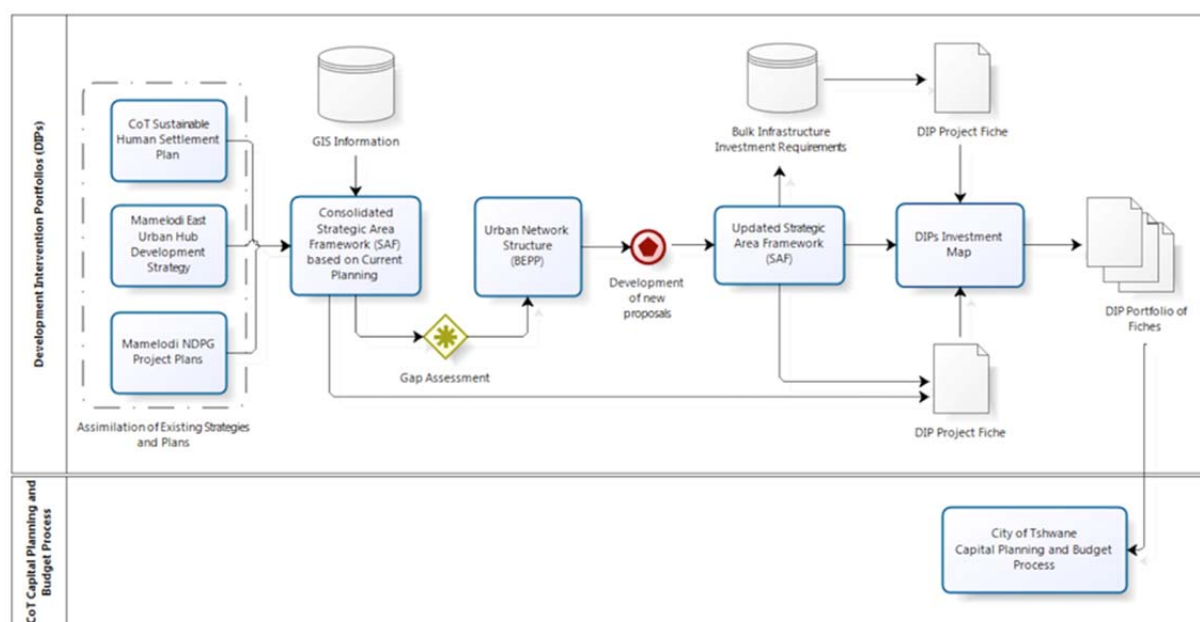
The Service Delivery and Budget Implementation Plan (SDBIP) details the implementation of service delivery and the budget for the financial year.

Built Environment Performance Plan

The Built Environment Performance Plan (BEPP) is a requirement of the Division of Revenue Act (No. 10 of 2014) for the eligibility of infrastructure. BEPPs are undertaken each financial year and provide an overview of the municipality's built environment and an indication of how the City is to strategically apply its capital financing so as to trigger spatial integration and transformation, in line with national and local policy objectives. In so doing, the BEPPs seek to spatially align public investment within specific target areas so as to achieve a more integrated, compact, inclusive, liveable, productive and sustainable urban form.

Development Intervention Portfolios

Figure C-17: Development Intervention Portfolios Integration with Capital Planning and Budgeting



Source: Mamelodi Development Intervention Portfolio

This process ensures that the CIF and its information system (CaPS) will be fed with projects emanating from a process that has its roots in the Tshwane Vision 2055, MSDF, RSDF, Sustainable Human Settlement Plan as well as other relevant developmental strategy documents and plans. From these base documents, a consolidated Strategic Area Framework (SAF) will be developed for each of the strategically identified DIPs precincts, nodes or corridors. A gap assessment is then undertaken between the consolidated SAF and the requirements as contained in the Built Environment Performance Plans. From this gap analysis, an updated SAF is developed from which a DIPs Investment map is finally derived. The DIPs process further formalises the project preparation processes by propagating a standardised methodology and framework for the documentation of project information emanating from the updated SAF. These projects will be synthesized and captured on a DIPs Project Fiche (project summary document) as shown in Figure C-18.

The benefit of having all projects captured on the prescribed Project Fiche template is that the project preparation stage, required for the project to receive meaningful priority in the CaPS system, is largely taken care of. The challenge for sustainable improvement of the City's capital programme will over time move towards the meaningful identification of new project pro-actively, rather than reactively. The DIPs process will facilitate this gradual shift towards pro-active project identification, actively seeking to address the various objectives and goals as articulated in the various strategic documents of the City, Province and National Government.

Figure C-18: Development Intervention Portfolio Project Fiche

General Project Information			
Project ID			
GIS ID			
Project Name			
Project Scope	Infrastructure Class		
	Project Action		
	Infrastructure Type		
	Project Category		
Works Location	City Region		
	Ward		
	Suburb		
Project Lifecycle			
Project Status			
Project for Informal Settlement/Marginalised Area			


Implementing Agent and Stakeholders			
Implementing Agent	Strategic Unit		
	Department		
	Agency		
Stakeholders (CoT Departments/ Divisions)			

Financial Information			
Project Value		Cost Accuracy	
Roll Out Period			
Planned Roll Out Commencement Year			
Funding Sources			
	% Funding Secured		
	% Funding Secured		
	% Funding Secured		
Funding Gap			

Project Readiness (Upstream Requirements)		
	Lead Time	

Risk Management			
Likelihood		RAG Risk	
Severity			
Likelihood		RAG Risk	
Severity			

Linked Projects		
	Dependency	
	Dependency	

City Planning and Development Capital Investment Planning Director Ms Pumza Letsoalo 012 358 7338 pumzal@tshwane.gov.za		 CITY OF TSHWANE IGNITING EXCELLENCE	
Spatial Transformation and Development Strategy Alignment			
Tshwane Vision 2055			
	Service Delivery and Budget Implementation Plan	KPA1: Provide Sustainable Service Infrastructure and Human Settlement Management	
		KPA2: Promote Shared Economic Growth and Job Creation	
		KPA3: Ensure Sustainable Safer City and Integrated Social Development	
		KPA4: Promote Good Governance and Active Citizenry	
		KPA5: Improved Financial Sustainability	
Built Environment Performance Plan	KPA6: Continued Organisational Development, Transformation and Innovation		
	A: Well Governed City		
	B: Inclusive City		
	C: Productive City		
	D: Sustainable City		

C.2.4 Alignment between IDP, SDF and BEPP

In terms of the Municipal Systems Act (MSA) the IDP is a single, inclusive and strategic plan for the development of the municipality which links, integrates and coordinates plans and takes into

account proposals for the development of the municipality; aligns the resources and capacity of the municipality with the implementation of the plan; and forms the policy framework and general basis on which annual budgets must be based. The CoT IDP is premised on six Strategic Objectives:

- Providing sustainable services infrastructure and human settlements
- Promoting shared economic growth
- Ensuring sustainable, safer communities and integrated social development
- Promoting good governance and active citizens
- Improving financial sustainability
- Continuing institutional development, transformation and innovation.

The following factors were taken into consideration when determining Strategic Focus Areas for 2015/16:

- National service delivery agenda as outlined in the State of the Nation Address and other key government articulations,
- The achievements that have been made by the City since the beginning of the current term of Council,
- The economic climate and how it is to affect the development performance of the City, and
- The financial position of the City and a need to balance service delivery with strengthening the City's financial position

Based on the above, the City then agreed that the focus for 2015/16 f/y should be on:

- Continued service delivery through the provision of basic services and conclusion on some of the key projects and programmes initiated since the beginning of the term;
- Urban management through the maintenance of the City's key infrastructure in line with the Council approved Service Delivery Charter to bring to effect and improved responsiveness to service delivery through regionalization;
- Continued development and operationalization of social and recreational facilities;
- Implementation of renewal energy initiatives;
- Fast tracking formalization of informal settlements; and
- Acceleration of Catalytic Projects such as the roll-out of free WIFI and A Re Yeng transport services

In terms of the MSA, one of the core components of the IDP is the Spatial Development Framework (SDF). The SDF provide spatial development directives and guidelines to address development across the city with specific spatial outcomes and spatial targeting. The aim is firstly, to address the legacy of apartheid planning, secondly provide a framework for integration of different land uses and previously segregated communities. Thirdly it unlocks land in strategically located areas for investment through specific spatial development proposals.

The Built Environment Performance Plan provides details of investment in infrastructure on both social and engineering services in the areas identified by the SDF. This includes details on required investment to support the interventions required from the spatial development perspective. In the case of the City the focus of the investment contained in the BEPP and Capital Investment Framework is on the provision of sustainable services infrastructure and human settlements. The focus is towards spatial targeting with a primary focus on the movement system as the key spatial restructuring element of the built environment. More than eighty percent of the capital budget is allocated towards the development and maintenance of water, sanitation, electricity, roads and storm water systems throughout the city. Transport has been allocated the larger part of this budget. There is a strong bias towards the development of infrastructure in the previously disadvantaged areas in the city and to eradicate the services backlog, however the investment in maintenance of key economic infrastructure to ensure economic growth is also a key focus for 2015/16 financial year.

To demonstrate this, key integration zones contained in the SDF have been identified as:

- Mabopane Urban Hub
- Atteridgeville Urban Hub
- Hammanskraal Urban Hub
- Mamelodi Urban Hub
- Ga-Rankuwa Urban Hub

The City have also identified the following areas to form part of the programme:

- Refilwe Urban Core
- Olievenhoutbosch Urban Core
- Ekangala Urban Core
- Zithobeni Urban Core

The identified spatial integration zones and the investment areas as identified in the SDF as well as the capital projects for financial year 2015/16 seek to align to the strategic objectives of the City especially around Providing sustainable services infrastructure and human settlements; Promoting shared economic growth; Ensuring sustainable, safer communities and integrated social development. Such an alignment is demonstrated by the budget allocated towards projects for 2015/16 and to a certain degree the spatial location of these.

C.2.5 2015/16 IDP and SDBIP Performance Planning

C.2.5.1 2015/16 IDP Review

The following progress can be reported with regards to the 2015/2016 IDP

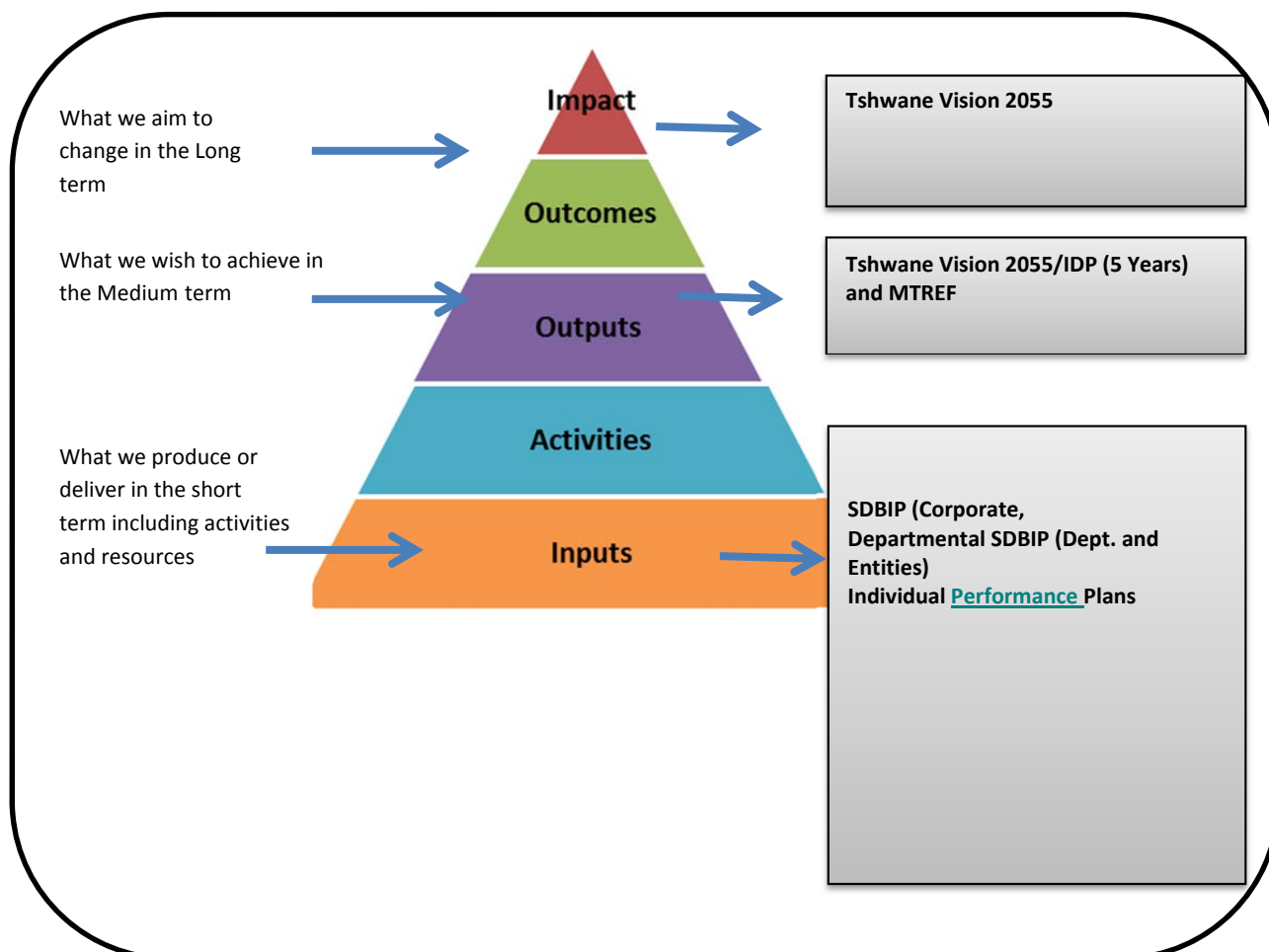
- The 2011/16 Council approved IDP for the Council term.
- The Strategic Objectives in the 5 year IDP and SDBIP are measured through indicators and targets and reported on quarterly and annually.
- The 2015/16 IDP has taken into consideration the Tshwane Vision 2055 Outcomes and strategic actions for the first decade of game changing.
- Measuring our long term Vision:
 - **Refine the long-term indicators** indicated in the Tshwane Vision 2055.
 - **Develop measurable plans** to support the long-term indicators to guide future planning.
 - **Set baselines and standards** for services developed in line with the vision and outcomes.

C.2.5.2 Linking the 2015/16 Performance Plans to BEPP

The city has undertaken to refine its submission towards the proposed BEPP indicators. The City proposes an incremental approach to measuring the proposed BEPP indicators for the following reasons:

- Assess the **applicability** of the proposed BEPP indicators – identify which indicators can be measured in the 2015/16 IDP and SDBIP
- Segment the BEPP indicators into the City's **outcomes based approach** to planning and monitoring
- In cases where BEPP indicators are not reflected to the 2015/16 plans, **set the baselines, develop plans** and place these within the Council approved plans in 2015/16 onwards

Figure C-19: Linking 2015/2016 performance planning to BEPP



C.2.5.3 Way Forward

The way forward with regards to performance measurement of the 2015/16 IDP and alignment with the BEPP is shown in Table C.2.5-1.

Table C.2.5-1: Way forward for performance measurements of 2015/16 IDP and BEPP alignment

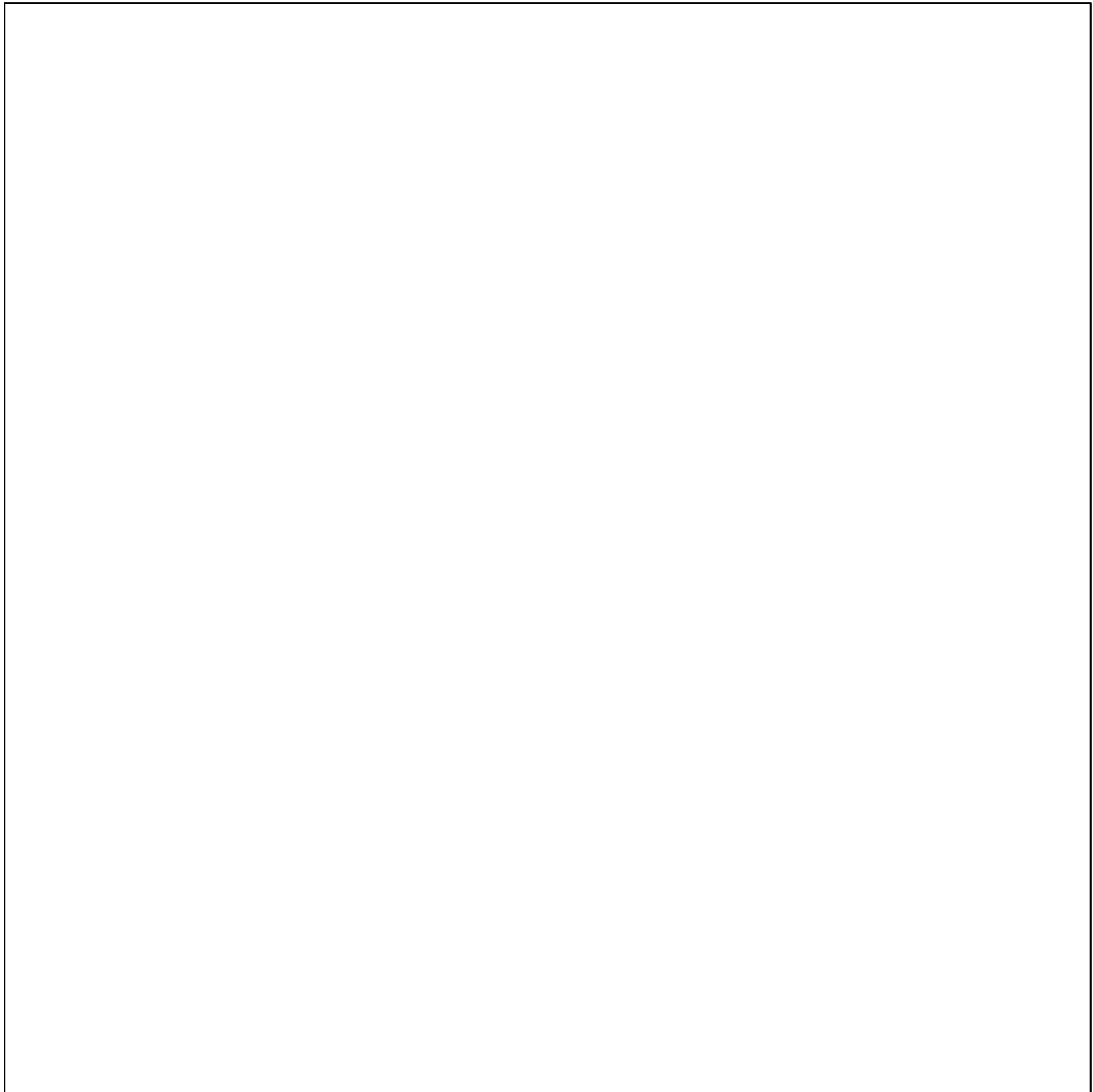
Actions	Responsibility
Identify and segment applicable indicators and targets and approve with IDP and SDBIP	CSPM by May 2015
Develop system descriptions for IDP and SDBIP indicators (including baselines and monitoring systems)	CSPM and Departments with support from CSP by August/Sept 2015
Identify indicators to be monitored at a departmental level	CSPM and CSP coordinator with departments
Develop internal capacity to undertake quarterly monitoring, evidence collection and verification (short term and long term)	CSPM and CSP coordinator (Sept 2015)
Identify indicators for next financial year	CSPM, CSP coordinator and CSP – February 2016

C.2.6 City of Tshwane Position of BEPP Indicators

The City of Tshwane has been part of the development of the City Support Programme indicators and through this it has provided detailed input that can ensure the measurability of these indicators. Since the BEPP indicators are no different to the CSP indicators, the process that guides the latter should be applied to the former as well.

In a letter that was sent by National Treasury to the City Manager of Tshwane, it was communicated that CSP indicators will not be a requirement for municipal spatial performance planning in the 2015/16 due to the fact that the National Treasury team is still finalising this. The impact of the process on the BEPP indicators is that they too cannot be used as a basis for spatial performance planning in this 2015/16 BEPP. Having said this, the City of Tshwane still maintains that the alignment of BEPP to CSP needs to be strengthened towards streamlined spatial performance planning and reporting to reduce duplication. By this we call for one set of indicators that satisfy both BEPP and CSP requirements.

D Outcomes and Outputs



D.1.1 Introduction

Budget guidelines relating to the compilation of the 2015/16 capital budgets were compiled in consultation with the City Planning and Development Department and IDP Office. Departments used these budget guidelines as a basis for their MTREF planning. Budget indicatives were issued to departments to take into consideration and also align budget proposals to departmental business plans, objectives and targets.

All capital project requests were captured on the Capital Planning System (CaPS) in accordance with a data template, which was designed in consultation between City Planning and Development Department, Finance Department and City Strategies and Performance Management.

The outcome of the Budget Steering Committee hearings required departments to prioritise capital projects and resource allocations within the context of affordability taking into account inter alia contractual obligations, ongoing infrastructure maintenance and executive commitments.

The compilation of the capital budget in terms of internal capacity (council funds) is based on the application of sound financial management principles in order to ensure that a funded budget is tabled. Taking this into consideration the funding capacity for the 2015/16, 2016/17 and 2017/2018 financial years is shown in Table D.1.1-1.

Table D.1.1-1: CoT 2015/16 MTREF Capital Budget

Budget 2015/16	Budget 2016/17	Budget 2017/18
R3 828 798 082	R3 981 533 700	R4 156 126 000

D.1.2 2015/16 MTREF Capital Budget by Departmental Cluster

The 2015/16 MTREF capital budget by departmental cluster is shown in Table D.1.2-1 and Figure D-1.

Table D.1.2-1: 2015/16 MTREF Capital Budget by Departmental Cluster

Departmental Cluster	Budget 2015/16	%	Budget 2016/17	%	Budget 2017/18	%
Corporate and Shared Services	R10 189 400,00	0,3%	R37 594 700,00	0,9%	R35 000 000,00	0,8%
Economic Development	R78 000 000,00	2,0%	R103 000 000,00	2,6%	R103 000 000,00	2,5%
Emergency Services	R6 000 000,00	0,2%	R6 000 000,00	0,2%	R6 000 000,00	0,1%
Environmental Management	R103 000 000,00	2,7%	R127 000 000,00	3,2%	R105 000 000,00	2,5%
Group Audit and Risk	R13 000 000,00	0,3%	R13 000 000,00	0,3%	R13 000 000,00	0,3%
Group Financial Services	R35 250 000,00	0,9%	R25 000 000,00	0,6%	R40 000 000,00	1,0%
Group Information and Communication Technology	R172 273 260,00	4,5%	R155 700 000,00	3,9%	R140 500 000,00	3,4%
Health and Social Development	R78 000 000,00	2,0%	R55 000 000,00	1,4%	R61 000 000,00	1,5%

Departmental Cluster	Budget 2015/16	%	Budget 2016/17	%	Budget 2017/18	%
Housing and Human Settlement	R670 500 072,00	17,5%	R688 884 650,00	17,3%	R719 257 650,00	17,3%
Metro Police Services	R10 000 000,00	0,3%	R10 000 000,00	0,3%	R10 000 000,00	0,2%
Office of the City Manager	R280 000 000,00	7,3%	R280 000 000,00	7,0%	R290 000 000,00	7,0%
Service Infrastructure	R802 500 000,00	21,0%	R902 500 000,00	22,7%	R995 500 000,00	24,0%
Sports and Recreation	R97 000 000,00	2,5%	R100 000 000,00	2,5%	R106 000 000,00	2,6%
Transport	R1 473 085 350,00	38,5%	R1 477 854 350,00	37,1%	R1 531 868 350,00	36,9%
Total	R3 828 798 082,00	100,0%	R3 981 533 700,00	100,0%	R4 156 126 000,00	100,0%

It is evident from the table above that the majority of the capital budget is allocated to the following departments:

- Transport (38,5%)
- Service Infrastructure (which includes Energy and Electricity, and Water and Sanitation) (21%)
- Housing and Human Settlement (17,5%)

This capital budget distribution is indicative of a basic service delivery focussed budget where significant investment is being focussed on achieving a desirable built environment and urban form. Some of the main projects and key focus areas of the budget and IDP to be addressed in the 2014/15 financial year include amongst others:

- Emergency Services
 - Renovation & Upgrading Of Facilities - R4 million
 - Emergency Services Tools and Equipment - R2 million
- Health and Social Development
 - Upgrading Of Clinic Dispensaries - R5 million
 - Social Development center in Hammanskraal - R13 million
 - Social Development center in Winterveldt - R10 million

- Social Development center in Mabopane - R10 million
- New Soshanguve Clinic - R10 million
- New Gazankulu clinic - R10 million
- Upgrade and extension of Zithobeni Clinic - R10 million
- Replacement of Rayton Clinic - R10 million
- Housing and Human Settlement

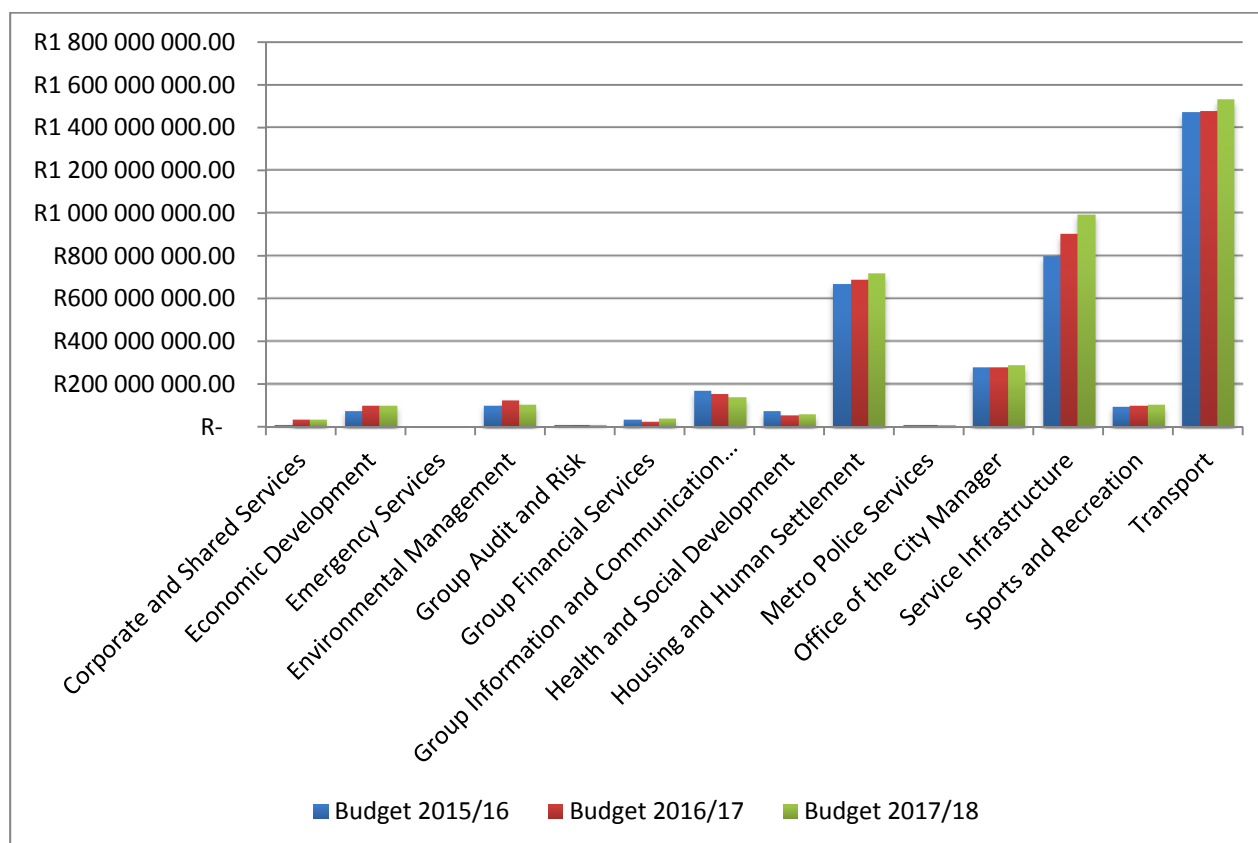
Formalisation is an IDP and budget key focus area in the 2015/16 budget and the following amounts have been budgeted:

 - Project Linked Housing - Housing Facilities - R2,2 million
 - Project Linked Housing - Water Provision - R250 million
 - Sewerage - Low Cost Housing - R236 million
 - Roads and Stormwater - Low Cost Housing - R71 million
 - Project Linked Housing - Acquisition Of Land - R109 million
- Group Information and Communication Technology
 - One Integrated Transaction Processing System - R21,5 million
 - Computer Equipment Deployment - End user computer hardware equipment - R15 million
 - E-Initiative Supporting the Smart City - R15 million
 - BPC and SCOA - R20 million
 - Credit Control Solution - R25 million
 - Interactive Digital Centre - R74 million
- Metro Police Services
 - Purchase of policing equipment – R10,0 million
- Office of the City Manager
 - Implementation of Tsosoloso Programme - R100 million
 - City Hall Renovations - R30 million
 - Implementation of the Re-Aga Tshwane Programme - R150 million
- Service Infrastructure

- Upgrading/ Strengthening of Existing Network Schemes - R4 million
- Payments to Townships for Reticulated Towns - R3,5 million
- Township Water Services Developers: Tshwane Contributions - R2,2 million
- Lengthening Of Network & Supply Pipelines - R5 million
- Water Supply To Agricultural Holdings - R3 million
- Replacement Of Worn Out Network Pipes – R18,8 million
- Electricity for All – R157 million
- Replacement, Upgrade, Construct Waste Water Treatment Works Facilities - R90 million
- Strengthening 11kV Cable network - R15 million
- Strengthening 11kV Overhead Network - R15 million
- Tshwane Public Lighting Program – R70 million
- Refurbishment of Water Networks and Backlog Eradication - R78,5 million
- Replacement & Upgrading: Redundant Bulk Pipeline Infrastructure - R59,5 million
- Bulk Sewer In Klip/Kruisfontein Phase 3B - R20 million
- Reduction Water Losses: Water Networks - R4 million
- Replacement of Obsolete And non functional Equipment - R1,5 million
- New Bulk Infrastrucutre - R100 million
- New Connections - R20 million
- Electrification of Winterveld - R30 million
- Reservoir Extensions - R57,5 million
- Rooiwal Power Station Refurbishment - R8 million
- Bulk Sewer Supply - Franspoort - R1,5 million
- Transport
 - Major Stormwater Systems: Klip/Kruisfontein - R20 million
 - Shova Kalula Bicycle Project - R10 million
 - Mabopane Station Modal Interchange - R55 million
 - Block W - Stormwater Drainage - R20 million

- Major Stormwater Drainage System: Majaneng - R15 million
- Doubling Of Simon Vermooten - R25 million
- Flooding Backlogs: Stinkwater & New Eersterust Area - R15 million
- Flooding Backlogs: Sosh & Winterveldt Area – R400 million
- Flooding Backlogs: Mamelodi, Eersterust - R10 million
- Traffic Flow Improvement at Intersections - R5 million
- Flooding backlog: Kudube Unit 6 - R12 million
- Flooding backlog: Matanteng - R10 million
- Flooding backlog: Atteridgeville - R6 million
- Flooding Backlogs: Soshanguve South - R20 million
- Flooding backlog: New Eersterust x 2 - R15 million
- Upgrading of Maunde - R4 million
- CBD and surrounding areas (BRT) - (Transport Infrastructure) - R745,6 million
- Upgrading of Road from gravel to tar in Zithobeni Ward 102 - R6 million
- Upgrading of Road from gravel to tar in Ekangala Ward 103&104 - R12 million
- Upgrading of Road from gravel to tar in Ekangala Ward 105 - R6 million
- Operation Reclaim - R6 million

Figure D-1: 2015/16 MTREF Capital Budget by Departmental Cluster



D.1.3 2015/16 MTREF Capital Budget by Funding Source

The 2015/16 MTREF capital budget by funding source is shown in Table D.1.3-1 and Figure D-2.

Table D.1.3-1: 2015/16 MTREF Capital Budget by Funding Source

Funding Source	Budget 2015/16	%	Budget 2016/17	%	Budget 2017/18	%
Council Funding	R23 000 000	0,6%	R145 000 000	3,6%	R195 000 000	4,7%
PTIS - Public Transport, Infrastructure Systems Grant	R770 609 000	20,1%	R759 902 000	19,1%	R799 392 000	19,2%
NDPG - Neighbourhood Development Partnership Grant	R100 000 000	2,6%	R80 000 000	2,0%	R80 000 000	1,9%
USDG - Urban Settlements Development Grant	R1 500 683 000	39,2%	R1 574 837 000	39,6%	R1 664 734 000	40,1%
INEP - Integrated National Electrification Programme	R37 000 000	1,0%	R40 000 000	1,0%	R60 000 000	1,4%
CRRF - Capital Replacement Reserve Fund	R5 000 000	0,1%	R5 000 000	0,1%	R5 000 000	0,1%

Funding Source	Budget 2015/16	%	Budget 2016/17	%	Budget 2017/18	%
Other Contributions	R4 066 682	0,1%	R200 000	0,0%	R-	0,0%
FMG - Financial Management Grant	R250 000	0,0%	R-	0,0%	R-	0,0%
Borrowings	R1 200 000 000	31,3%	R1 200 000 000	30,1%	R1 200 000 000	28,9%
Public Contributions & Donations	R150 000 000	3,9%	R130 000 000	3,3%	R130 000 000	3,1%
Social Infrastructure Grant	R33 000 000	0,9%	R32 000 000	0,8%	R22 000 000	0,5%
Gautrans Grant	R-	0,0%	R12 000 000	0,3%	R-	0,0%
ICDG (Integrated City Development Grant)	R5 189 400	0,1%	R2 594 700	0,1%	R-	0,0%
Total	R3 828 798 082	100,0%	R3 981 533 700	100,0%	R4 156 126 000	100,0%

The Capital Budget is funded from the following sources:

- Internally generated revenue (including Public Contributions and Donations and CRR) amounts to approximately R177 million (4,6%).
- Borrowings amounts to R1,2 billion (31,3%).
- Grant funding amounts to R2,45 billion (64%).

The following with regard to conditional grants should be noted:

- Urban Settlements Development Grant (USDG)

The purpose of the USDG is to assist metropolitan municipalities to improve urban land production to the benefit of poor households, by supplementing the revenues of metropolitan municipalities to: reduce the real average cost of urban land, increase the supply of well-located land, enhance tenure security and quality of life in informal settlements, improve spatial densities and to subsidise the capital costs of acquiring land and providing basic services for poor households. The gazetted allocations amount to R1,5 billion (39,2%), R1,574 billion (39,6%) and R1,664 billion (40,1%) in the 2015/16, 2016/17 and 2017/18 financial years respectively.

- Public Transport, Infrastructure and Systems Grant

The purpose of the grant is to provide for accelerated planning, construction and improvement of public and non-motorised transport infrastructure and services. The gazetted allocations amount to R770 million (20,1%), R759 million (19,1%) and R799 million (19,2%) in the 2015/16, 2016/17 and 2017/18 financial years respectively.

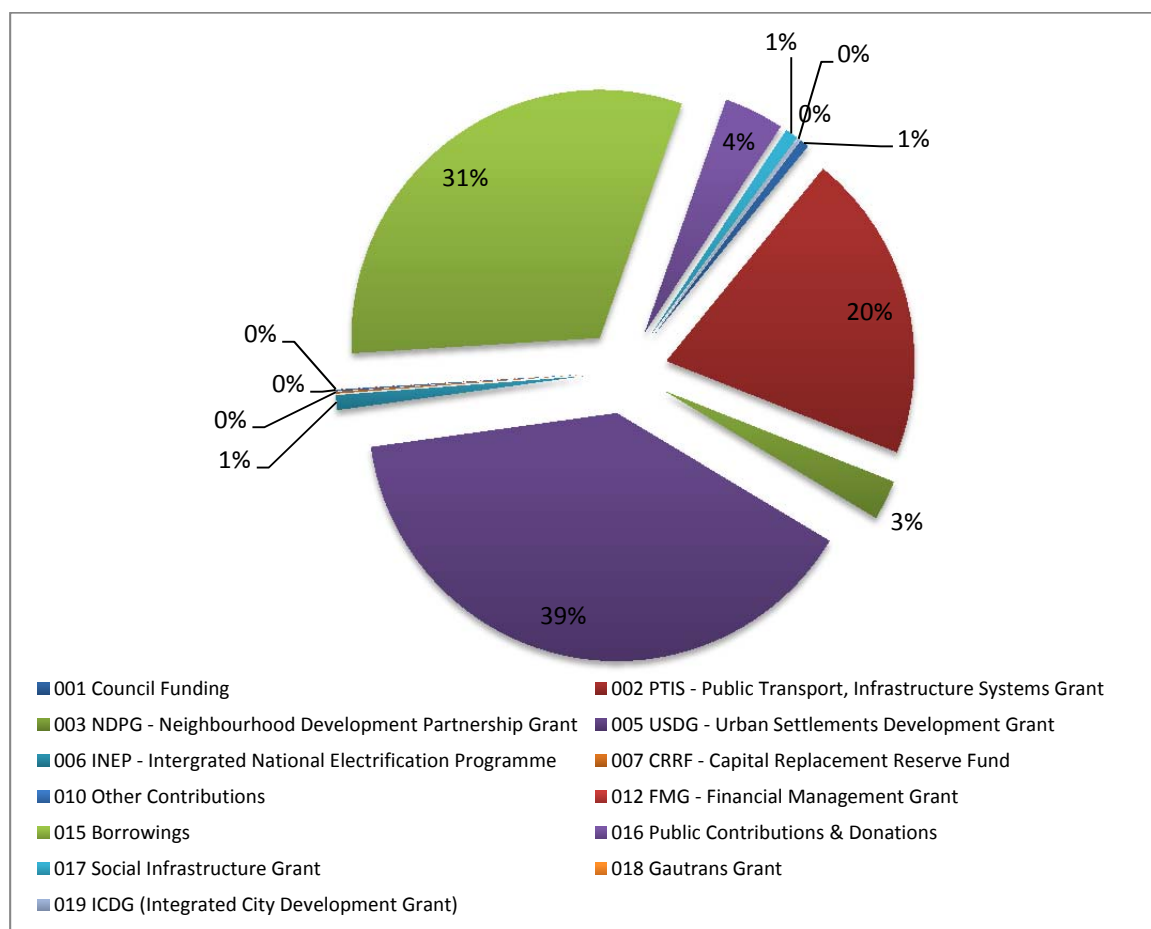
- Neighbourhood Development Partnership Grant

The purpose of this grant is to support neighbourhood development projects that provide community infrastructure and create the platform for other public and private sector development, towards improving the quality of life of residents in targeted underserved neighbourhoods. R100 million (2,6%), R80 million (2,0%) and R80 million (1,9%) have been gazetted for the 2015/16, 2016/17 and 2017/18 financial years respectively.

- Integrated National Electrification Programme

The purpose of this grant is to implement the Integrated National Electrification Programme (INEP) by providing capital subsidies to municipalities to address the electrification backlog of occupied residential dwellings, clinics and the installation of bulk infrastructure and rehabilitation and refurbishment of electricity infrastructure in order to improve the quality of supply. R37 million (1,0%), R40 million (1,0%) and R60 million (1,4%) have been gazetted for the 2015/16, 2016/17 and 2017/18 financial years respectively.

Figure D-2: 2015/16 Financial Year Capital Budget by Funding Source



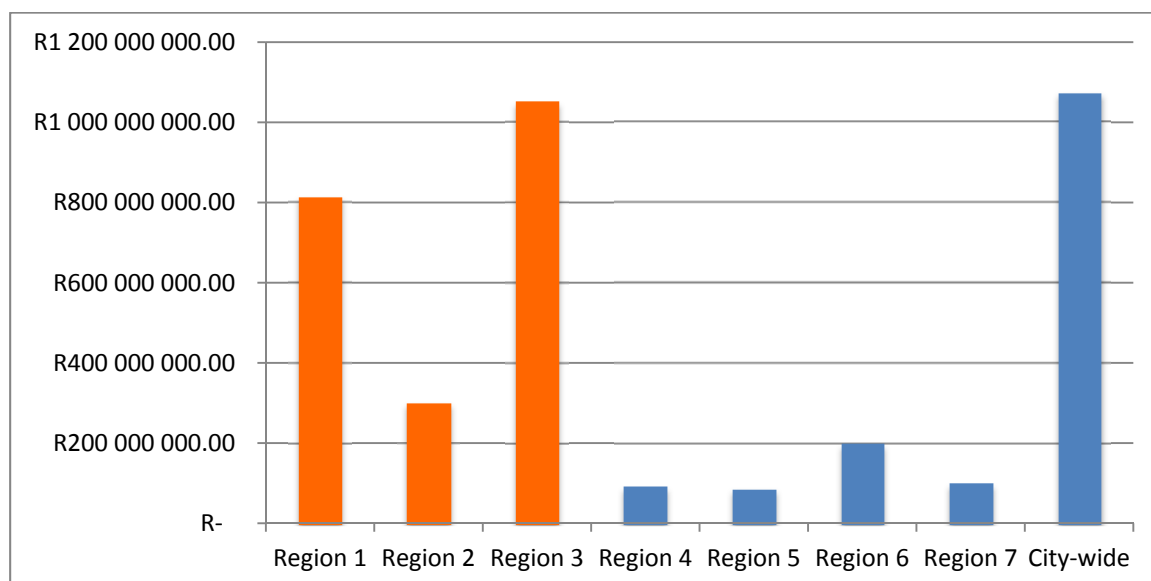
D.1.4 Spatial Analysis of Capital Expenditure

D.1.4.1 Value of Capital Expenditure by Region

The regional capital expenditure analysis was undertaken by means of the Tshwane Capital Planning system, which allows for the spatial referencing of capital projects. The CaPS system indicates that 187 projects comprise the 2015/2016 MTREF capital budget, of which a 122 (65%) of the projects are spatially reference.

The expenditure analysis indicates that approximately R1 billion (29%) of the 2015/16 MTREF capital budget is spent City Wide, whereas the remainder of the budget is distributed over the various regions (Refer to Figure D-3). Region 1 and Region 3 receive the majority of the capital expenditure at 22% and 28% respectively. Region 2 receives the third most capital expenditure at 8% of the capital budget.

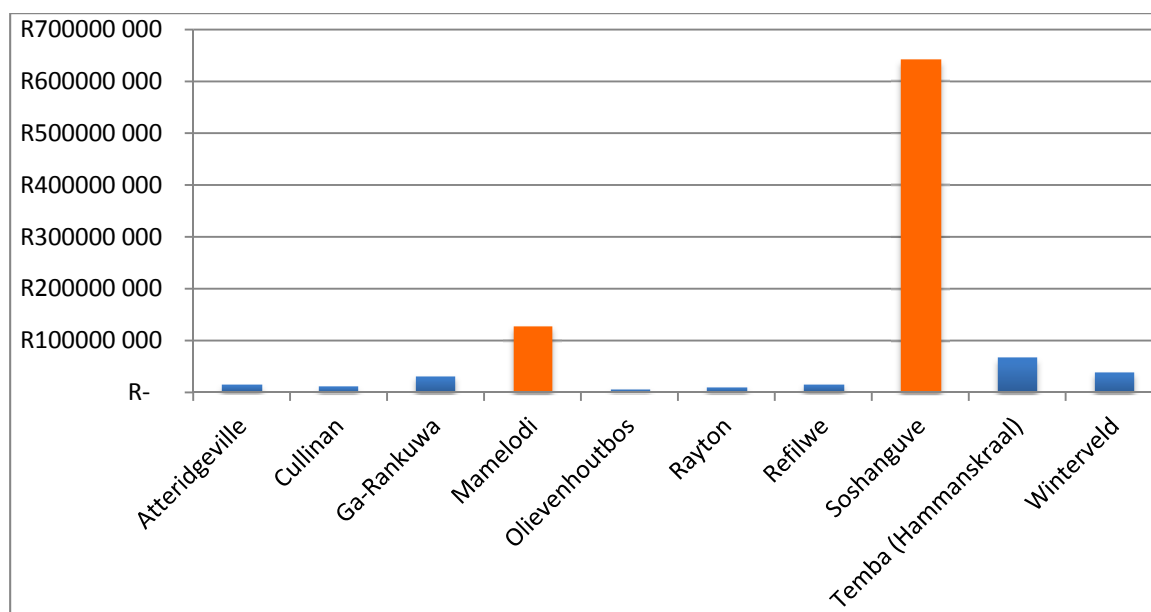
Figure D-3: Regional Expenditure Analysis of the 2015/16 MTREF Capital Budget



D.1.4.2 Value of Capital Expenditure by Urban Hub Area

The MSDF urban core capital expenditure analysis was undertaken by means of the Tshwane Capital Planning system, which allows for the spatial referencing of capital projects. The capital expenditure analysis of the 2015/16 MTREF Capital Budget by MSDF urban core area is shown in Figure D-4.

Figure D-4: MSDF Urban Core Area Expenditure Analysis of the 2015/16 MTREF Capital Budget



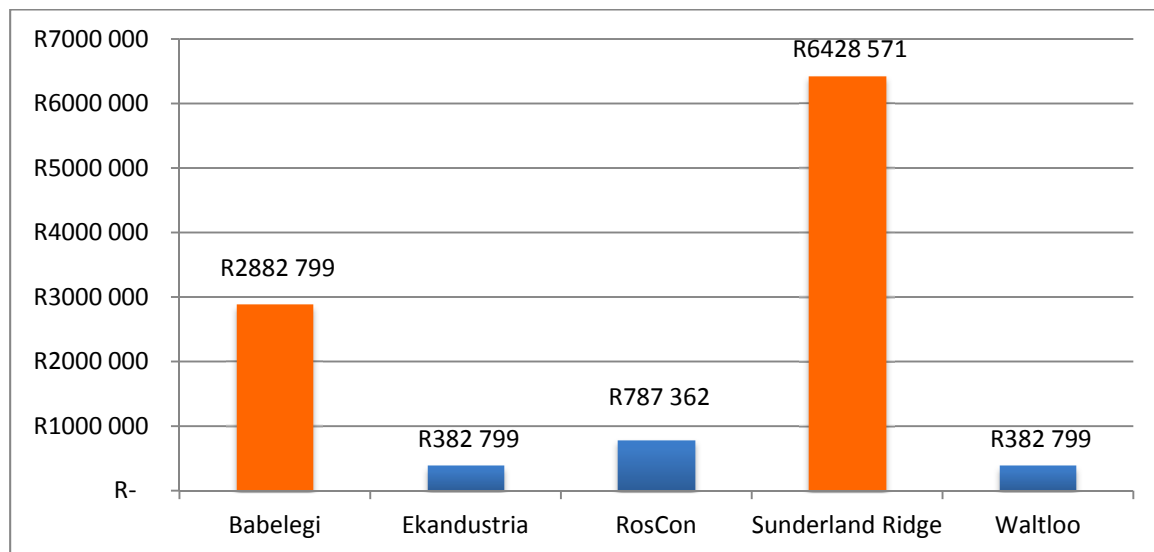
The expenditure analysis indicates that approximately R912 million is spent on Urban Core areas, which amounts to approximately 24% of budget total. The comparative spending analysis of the 2015/16 MTREF capital budget by Urban Core area indicates that the majority of the Urban Core expenditure is allocated to Soshanguve at R642 million (66%) followed by Mamelodi at R128 million

(13%). Temba (Hamanskraal) urban core receives the third most capital expenditure at R67 million (7%) of the capital budget.

D.1.4.3 Value of Capital Expenditure by Industrial Node

The MSDF industrial node capital expenditure analysis was undertaken by means of the Tshwane Capital Planning system, which allows for the spatial referencing of capital projects. The capital expenditure analysis of the 2015/16 MTREF Capital Budget by MSDF urban core area is shown in Figure D-5.

Figure D-5: MSDF Industrial Node Expenditure Analysis of the 2015/16 MTREF Capital Budget



The expenditure analysis indicates that only R10.8 million (0,29% of the capital budget is spent on Industrial nodes. The comparative spending analysis of the 2015/16 MTREF capital budget by industrial node indicates that the majority of the industrial node expenditure is allocated to Sunderland Ridge at R6.4 million (59%) followed by Babelegi at R2.8 million (27%).

D.1.4.4 Value of Capital Expenditure by Mayoral Priority

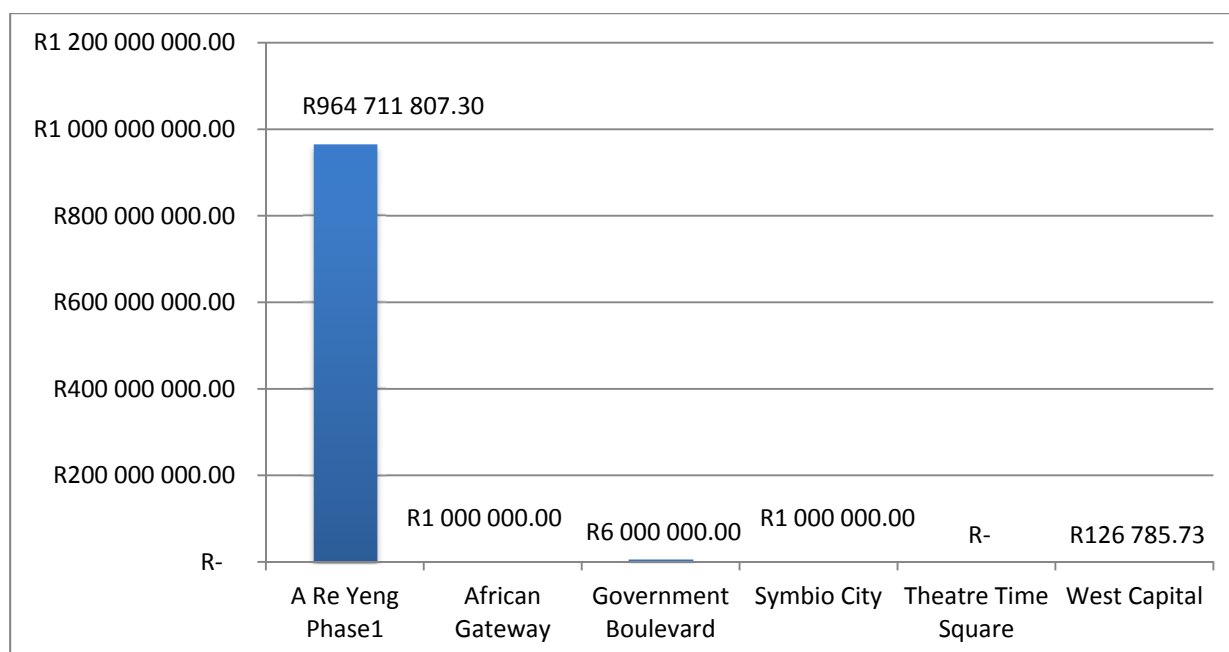
The mayoral priority projects are articulated annually as part of the State of the City (SOCA) address. The 2015/16 MTREF capital budget expenditure analysis was undertaken in relation to the following mayoral priority projects:

- A Re Yeng Phase1
- African Gateway
- Government Boulevard
- Symbio City

- Theatre Time Square
- West Capital

The expenditure analysis indicates that approximately R972 million (26%) of the capital budget is spent on projects related to mayoral priorities. The comparative spending analysis of the 2015/16 MTREF capital budget by mayoral priority indicates that the vast majority of the mayoral priority expenditure is allocated to the A Re Yeng Phase 1 project at R964 million (99%).

Figure D-6: Mayoral Priority Expenditure Analysis of the 2015/16 MTREF Capital Budget



D.1.4.5 Asset Management

This table brings together the core financial elements of asset management and summarises the capital programme in terms of new assets and the renewal of existing assets. The objective is to provide a complete picture of the municipality's asset management strategy, indicating the resources being deployed for maintaining and renewing existing assets, as well as the extent of asset expansion.

Budget Dimension	2015/2016	2016/2017	2017/2018
Capex - new	58,6%	60,4%	61,5%
Capex - renewal	39,7%	39,6%	43,3%

In terms of MFMA Circulars 55 and 66 at least 40% of the Capital Budget must be allocated towards renewal of existing assets. From the above table it can be seen that 39,7%, 39,6% and 43,3% of the budget has been allocated for the renewal of existing assets in the 2015/16, 2016/17 and 2017/18 financial years respectively.

E Institutional and Financial Arrangements

BEPP Content Guidelines – as per BEPP Guidance Note 2015/16-2017/18

This section of the BEPP should seek to:



- A description of the institutional arrangements required to give effect to the investment programme
- Organisational arrangements for integrated planning (functional integration of key sectors: economic, social facilities, basic services, housing, transport, and natural systems)
- Capital programme management
- Supply chain management and procurement plan
- Partnerships

Annexure A:

Performance Matrix

A detailed matrix of built environment performance indicators, with baselines and target values, as developed in 2015/16